SECTION BRAKE CONTROL SYSTEM

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< PRECAUTION > PRECAUTION PRECAUTIONS

Precaution for Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT PRE-TENSIONER"

The Supplemental Restraint System such as "AIR BAG" and "SEAT BELT PRE-TENSIONER", used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted. Information necessary to service the system safely is included in the "SRS AIR BAG" and "SEAT BELT" of this Service Manual.

WARNING:

Always observe the following items for preventing accidental activation.

- To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision that would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.
- Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see "SRS AIR BAG".
- Never use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.

PRECAUTIONS WHEN USING POWER TOOLS (AIR OR ELECTRIC) AND HAMMERS

WARNING:

Always observe the following items for preventing accidental activation.

- When working near the Air Bag Diagnosis Sensor Unit or other Air Bag System sensors with the ignition ON or engine running, never use air or electric power tools or strike near the sensor(s) with a hammer. Heavy vibration could activate the sensor(s) and deploy the air bag(s), possibly causing serious injury.
- When using air or electric power tools or hammers, always switch the ignition OFF, disconnect the battery, and wait at least 3 minutes before performing any service.

Service Procedure Precautions for Models with a Pop-up Roll Bar

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WARNING:

Always observe the following items for preventing accidental activation.

- Risk of passenger injury or death may increase if the pop-up roll bar does not deploy during a roll over collision. In order to reduce the chance of an incident where the pop-up roll bar is inoperative, all maintenance must be performed by a NISSAN or INFINITI dealer.
- Before removing and installing the pop-up roll bar component parts and harness, always turn the ignition switch OFF, disconnect the battery negative terminal, and wait for 3 minutes or more. (The purpose of this operation is to discharge electricity that is accumulated in the auxiliary power supply circuit in the air bag diagnosis sensor unit.)
- When repairing, removing, and installing a pop-up roll bar, always refer to SRS AIR BAG and SRS AIR BAG CONTROL warnings in the Service Manual.

Precaution for Battery Service

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Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

PRECAUTIONS

Precaution for Procedure without Cowl Top Cover

When performing the procedure after removing cowl top cover, cover the lower end of windshield with urethane, etc to prevent damage to windshield.

Precaution for Brake System

WARNING:

< PRECAUTION >

Since dust covering the front and rear brakes has an affect on human body, the dust must be removed with a dust collector. Never splatter the dust with an air blow gun. CAUTION:

- Brake fluid use refer to <u>MA-10, "Fluids and Lubricants"</u>.
- Never reuse drained brake fluid.
- Never spill or splash brake fluid on painted surfaces. Brake fluid may seriously damage paint. Wipe it
 off immediately and wash with water if it gets on a painted surface.
- Never use mineral oils such as gasoline or light oil to clean. They may damage rubber parts and cause improper operation.
- Always loosen the brake tube flare nut with a flare nut wrench.
- Tighten the brake tube flare nut to the specified torque with crowfoot (A) and torque wrench (B).
- Always confirm the specified tightening torque when installing the brake pipes.
- Turn the ignition switch OFF and disconnect the ABS actuator and electric unit (control unit) harness connector or the battery negative terminal before performing the work.
- Check that no brake fluid leakage is present after replacing the parts.

Precaution for Brake Control

- When starting engine or when starting vehicle just after starting engine, brake pedal may vibrate or motor operating noise may be heard from engine compartment. This is normal condition.
- When an error is indicated by ABS or another warning lamp, collect all necessary information from customer (what symptoms are present under what conditions) and check for estimate causes before starting diagnostic servicing. Besides electrical system inspection, check the brake booster operation, brake fluid level, and oil leaks.
- If tire size and type are used in an improper combination, or brake pads are not Genuine NISSAN parts, stopping distance or steering stability may deteriorate.
- ABS might be out of order or malfunctions by putting a radio (wiring inclusive), an antenna and a lead-in wire near the control unit.
- If aftermarket parts (car stereo, CD player, etc.) have been installed, check for incidents such as harness pinches, open circuits, and improper wiring.
- VDC system may not operate normally or a VDC warning lamp may light.
- When replacing the following parts with parts other than genuine parts or making modifications: Suspensionrelated parts (shock absorber, spring, bushing, etc.), tires, wheels (other than specified sizes), brake-related parts (pad, rotor, caliper, etc.), engine-related parts (muffler, ECM, etc.) and body reinforcement-related parts (roll bar, tower bar, etc.).

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- When driving with worn or deteriorated suspension, tires and brake-related parts.





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Precaution for Harness Repair

must be 110 mm (4.33 in) or less.]

< PRECAUTION >

• Never bypass the repair point with wire. (If it is bypassed, the turnout point cannot be separated and the twisted wire characteristics are lost.)









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PREPARATION

[WITH VDC]

PREPARATION А PREPARATION **Commercial Service Tool** INFOID:000000007565732 В Tool name Description С D Power tool Loosening bolts and nuts Е PBIC0190E BRC G Н J Κ L Μ Ν Ο Ρ

< PREPARATION >

COMPONENT PARTS

< SYSTEM DESCRIPTION >

SYSTEM DESCRIPTION

COMPONENT PARTS

Component Parts Location

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[WITH VDC]



COMPONENT PARTS

< SYSTEM DESCRIPTION >

1.	Steering angle sensor	2.	ABS warning lamp	3.	Brake warning lamp
4.	VDC OFF indicator lamp	5.	VDC warning lamp	6.	ABS actuator and electric unit (con- trol unit)
7.	Front wheel sensor	8.	Yaw rate/side/decel G sensor	9.	VDC OFF switch
10.	Rear wheel sensor				
A.	Back of spiral cable assembly	В.	Combination meter	C.	Engine room (right side)
D.	Steering knuckle	Ε.	Under center console	F.	Instrument driver lower panel

G. Rear axle

Component Description

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[WITH VDC]

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Compo	Reference	F	
	Pump		
	Motor		
	Actuator relay (Main relay)		BRO
	ABS IN valve		
ABS actuator and electric unit (control unit)	ABS OUT valve	BRC-9, "ABS Actuator and Electric Unit (Control Unit)"	G
	Pressure sensor		0
	Motor relay		
	Cut valve 1, Cut valve2		Н
	Suction Valve 1, Suction Valve 2		
Wheel sensor	BRC-10, "Wheel Sensor and Sensor Ro- tor"	I	
Stop lamp switch	BRC-10, "Stop Lamp Switch"		
Steering angle sensor	BRC-10, "Steering Angle Sensor"	.1	
Yaw rate/side/decel G sensor	BRC-10, "Yaw Rate/Side/Decel G Sen- sor"	0	
Brake fluid level switch	BRC-10, "Brake Fluid Level Switch"	K	
VDC OFF switch	BRC-10, "VDC OFF Switch"		
ABS warning lamp			
Brake warning lamp	BRC-11 "System Description"	L	
VDC warning lamp			
VDC OFF indicator lamp		NЛ	

ABS Actuator and Electric Unit (Control Unit)

Electric unit (control unit) is integrated with actuator and comprehensively controls VDC function, TCS function, ABS function and EBD function.

ELECTRIC UNIT (CONTROL UNIT)

• Brake fluid pressure, engine and transaxle are controlled according to signals from each sensor.

• If malfunction is detected, the system enters fail-safe mode.

ACTUATOR

The following components are integrated with ABS actuator.

Pump

The pump returns the brake fluid stored in the reservoir to the master cylinder by reducing the pressure.

Motor

The motor drives the pump according to the signals transmitted by the ABS actuator and electric unit (control unit).

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< SYSTEM DESCRIPTION >

Motor Relay

Activates or deactivates motor according to the signals transmitted by the ABS actuator and electric unit (control unit).

Actuator Relay (Main Relay)

Activates or deactivates each solenoid valve according to the signals transmitted by the ABS actuator and electric unit (control unit).

ABS IN Valve

The solenoid valve increases, holds or decreases the fluid pressure of each brake caliper according to the signals transmitted by the ABS actuator and electric unit (control unit).

ABS OUT Valve

The solenoid valve increases, holds or decreases the fluid pressure of each brake caliper according to the signals transmitted by the ABS actuator and electric unit (control unit).

Cut Valve 1, Cut Valve 2

The cut valve shuts off the normal brake fluid path from the master cylinder, when VDC/TCS is activated.

Suction Valve 1, Suction Valve 2

The suction valve supplies the brake fluid from the master cylinder to the pump, when VDC/TCS is activated.

Pressure Sensor

The pressure sensor converts the brake fluid pressure to an electric signal and transmits it to the ABS actuator and electric unit (control unit). [The pressure sensor is integrated in the ABS actuator and electric unit (control unit).]

Wheel Sensor and Sensor Rotor

When the sensor rotor rotates, the magnetic field changes. It converts the magnetic field changes to current signals (rectangular wave) and transmits them to the ABS actuator and electric unit (control unit).

Stop Lamp Switch

The stop lamp switch transmits the stop lamp switch signal (ON/OFF) to the ABS actuator and electric unit (control unit).

Steering Angle Sensor

The steering angle sensor detects the rotation amount, angular velocity and direction of the steering wheel, and transmits the data to the ABS actuator and electric unit (control unit) via CAN communication.

Yaw Rate/Side/Decel G Sensor

Yaw rate/side/decel G sensor detects yaw rate/side/decel G affecting the vehicle, and transmits the data to the ABS actuator and electric unit (control unit) as an analog voltage signal.

Brake Fluid Level Switch

The brake fluid level switch converts the brake fluid level to an electric signal and transmits it to the ABS actuator and electric unit (control unit).

VDC OFF Switch

VDC OFF switch can deactivate (turn OFF) the VDC/TCS function by pressing the VDC OFF switch.

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SYSTEM

< SYSTEM DESCRIPTION >

SYSTEM

System Description

- The system switches fluid pressure of each brake caliper to increase, to hold or to decrease according to signals from control unit in ABS actuator and electric unit (control unit). This control system is applied to VDC function, TCS function, ABS function and EBD function.
- Fail-safe function is available for each function and is activated by each function when system malfunction occurs.

SYSTEM DIAGRAM



CONDITION FOR TURN ON THE WARNING LAMP

ABS Warning Lamp

× ON - OFF

ABS warning lamp	Ν
_	
×	
	[V
×	
×	(
	ABS warning lamp

Brake Warning Lamp

×: ON –: OFF

Condition	Brake warning lamp (Note 1)	
Ignition switch OFF	-	
For 2 seconds after turning ignition switch ON	× (Note 2)	
2 seconds later after turning ignition switch ON	× (Note 2)	
EBD function is malfunctioning.	×	

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SYSTEM

< SYSTEM DESCRIPTION >

- 1: Brake warning lamp will turn ON in case of parking brake operation (when switch is ON) or of brake fluid level switch operation (when brake fluid is insufficient).
- 2: After starting the engine, brake warning lamp is turned off.

VDC Warning Lamp

×: ON ∆: Blink –: OFF

[WITH VDC]

Condition	VDC warning lamp
Ignition switch OFF	-
For 2 seconds after turning ignition switch ON	×
2 seconds later after turning ignition switch ON	-
VDC/TCS is activated while driving.	Δ
VDC/TCS function is malfunctioning.	×
ABS function is malfunctioning.	×
EBD function is malfunctioning.	×

CONDITION FOR TURN ON THE INDICATOR LAMP

VDC OFF Indicator Lamp

×: ON –: OFF

Condition	VDC OFF indicator lamp
Ignition switch OFF	-
For 2 seconds after turning ignition switch ON	X
2 seconds later after turning ignition switch ON	-
VDC OFF switch turned ON. (VDC function is OFF.)	X
VDC/TCS function is malfunctioning.	-
ABS function is malfunctioning.	-
EBD function is malfunctioning.	_

Fail-Safe

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ABS, EBD SYSTEM

If ABS malfunction electrically, ABS warning lamp and VDC warning lamp will turn ON. If EBD malfunction electrically, brake warning lamp, ABS warning lamp and VDC warning lamp will turn ON. Simultaneously, the VDC/TCS/ABS become one of the following conditions of the fail-safe function.

• For malfunction of ABS, only the EBD is activated and the condition of vehicle is the same condition of vehicles without TCS/ABS system.

NOTE:

ABS self-diagnosis sound may be heard. That is a normal condition because a self-diagnosis for "Ignition switch ON" and "The first starting" are being performed.

• For malfunction of EBD, EBD and ABS become inoperative, and the condition of vehicle is the same as the condition of vehicles without TCS/ABS, EBD system.

VDC/TCS

If VDC/TCS/ABS system malfunction electrically, VDC warning lamp is turned on, and the condition of vehicle is the same as the condition of vehicles without VDC/TCS control.

CAUTION:

If the Fail-Safe function is activated, then perform self-diagnosis for "ABS" with CONSULT. $VDC\ FUNCTION$

VDC FUNCTION : System Description

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 In addition to the TCS/ABS function, the driver steering amount and brake operation amount are detected by the steering angle sensor and pressure sensor, and the vehicle's driving status (amount of under steering/ over steering) is determined by the information from the yaw rate/side/decel G sensor, wheel sensor, etc., and this information is used to improve vehicle stability by controlling the braking and engine power to all four wheels.

The wheel spin of the drive wheels is detected by the ABS actuator and electric unit (control unit) using the

TCS FUNCTION

< SYSTEM DESCRIPTION >

- wheel speed signals from the four wheels, so if wheel spin occurs, the drive wheel right and left brake fluid pressure control and engine fuel cut are conducted while the throttle valve opening is restricted to reduce the engine torque and decrease the amount of wheel spin. In addition, the throttle opening is controlled to achieve the optimum engine torque.
- During TCS operation, TCS informs driver of system operation by blinking the VDC warning lamp.

During VDC operation, it informs driver of system operation by blinking the VDC warning lamp.

Electrical system diagnosis by CONSULT is available.

Electrical system diagnosis by CONSULT is available.

TCS FUNCTION : System Description

ABS FUNCTION

ABS FUNCTION : System Description

- The Anti-Lock Braking System detects wheel revolution while braking, and it improves handling stability during sudden braking by electrically preventing 4 wheel lock. Maneuverability is also improved for avoiding BRC obstacles.
- Electrical system diagnosis by CONSULT is available. EBD FUNCTION

EBD FUNCTION : System Description

- Н Electronic Brake force Distribution detects subtle slippages between front and rear wheels during braking, and it improves handling stability by electronically controlling brake fluid pressure which results in reduced rear wheel slippage.
- Electrical system diagnosis by CONSULT is available.

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DIAGNOSIS SYSTEM [ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)]

< SYSTEM DESCRIPTION >

[WITH VDC]

DIAGNOSIS SYSTEM [ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)]

CONSULT Function

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APPLICATION ITEMS

CONSULT can display each diagnostic item using the diagnostic test modes as following.

Mode	Function
Work support	This mode enables a technician to adjust some devices faster and more accurately by following the indica- tions on CONSULT.
Self diagnostic result	Self-diagnostic results can be read and erased quickly.
Data monitor	Input/Output data in the ABS actuator and electric unit (control unit) can be read.
Active test	CONSULT drives some actuators apart from the ABS actuator and electric unit (control unit) and also shifts some parameters in a specified range.
ECU identification	ABS actuator and electric unit (control unit) part number can be read.

WORK SUPPORT

Item	Description
ST ANGLE SENSOR ADJUSTMENT	Adjusts the neutral position of the steering angle sensor.
DECEL G SEN CALIBRATION	Calibrates decel G sensor.

SELF DIAGNOSTIC RESULT

Operation Procedure

Before performing the self-diagnosis for "ABS" with CONSULT, start the engine and drive the vehicle at 30 km/ h (19 MPH) or more for approximately 1 minute.

Display Item List Refer to <u>BRC-24, "DTC No. Index"</u>.

How to Erase Self-diagnosis Results

After erasing DTC memory for "ABS" with CONSULT, start the engine and drive the vehicle at 30 km/h (19 MPH) or more for approximately 1 minute as the final inspection, and make sure that the ABS warning lamp, VDC warning lamp and brake warning lamp turn OFF.

CAUTION:

If memory cannot be erased, perform applicable diagnosis. NOTE:

- When the wheel sensor malfunctions, after inspecting the wheel sensor system, the ABS warning lamp, VDC warning lamp and brake warning lamp will not turn OFF even when the system is normal unless the vehicle is driving at approximately 30 km/h (19 MPH) or more for approximately 1 minute.
- Brake warning lamp will turn ON in case of parking brake operation (when switch is ON) or of brake fluid level switch operation (when brake fluid is insufficient).
- VDC OFF switch should not stay "ON" position.

DATA MONITOR

Display Item List

DIAGNOSIS SYSTEM [ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)]

< SYSTEM DESCRIPTION >

[WITH VDC]

	I		×: Applicable ▼: Optional item	
	SELECT MONITOR ITEM			
Monitor item (Unit)	ECU INPUT SIGNALS	MAIN SIGNALS	Remarks	
FR LH SENSOR [km/h (MPH)]	×	×		В
FR RH SENSOR [km/h (MPH)]	×	×	Wheel speed	С
RR LH SENSOR [km/h (MPH)]	×	×	wheel speed	
RR RH SENSOR [km/h (MPH)]	×	×		D
STOP LAMP SW (On/Off)	×	×	Stop lamp switch signal status	E
BATTERY VOLT (V)	×	×	Battery voltage supplied to the ABS actuator and electric unit (control unit)	
GEAR	×	×	Gear position determined by TCM	BR
R POSI SIG (On/Off)	▼	•	Shift position judged by shift position (R) signal	
N POSI SIG (On/Off)	▼	•	Shift position judged by shift position (N) signal	G
P POSI SIG (On/Off)	▼	•	Shift position judged by shift position (P) signal	Н
SLCT LVR POSI	×	×	Shift position judged by shift position signal	
OFF SW (On/Off)	×	×	VDC OFF switch	I
YAW RATE SEN (d/s)	×	×	Yaw rate detected by yaw rate/side/decel G sensor	
DECEL G-SEN (G)	×	×	Decel G detected by yaw rate/side/decel G sensor	J
ACCEL POS SIG (%)	×	•	Throttle actuator opening/closing is displayed (Linked with accelera- tor pedal)	K
SIDE G-SENSOR (m/s ²)	×	•	Transverse G detected by yaw rate/side/decel G sensor	
STR ANGLE SIG (°)	×	•	Steering angle detected by steering angle sensor	L
ENGINE RPM [tr/min (rpm)]	×	•	Engine speed	M
FLUID LEV SW (On/Off)	×	•	Brake fluid level switch	
PRESS SENSOR (bar)	×	•	Brake fluid pressure detected by pressure sensor	Ν
FR RH IN SOL (On/Off)	▼	×	Operation status of front RH ABS IN valve	0
FR RH OUT SOL (On/Off)	▼	×	Operation status of front RH ABS OUT valve	0
FR LH IN SOL (On/Off)	▼	×	Operation status of front LH ABS IN valve	Ρ
FR LH OUT SOL (On/Off)	▼	×	Operation status of front LH ABS OUT valve	
RR RH IN SOL (On/Off)	▼	×	Operation status of rear RH ABS IN valve	
RR RH OUT SOL (On/Off)	▼	×	Operation status of rear RH ABS OUT valve	
FLUID LEV SW (On/Off) PRESS SENSOR (bar) FR RH IN SOL (On/Off) FR RH OUT SOL (On/Off) FR LH OUT SOL (On/Off) RR RH IN SOL (On/Off) RR RH OUT SOL (On/Off) RR RH OUT SOL (On/Off)	× × • • • • • • • • • • • • • • • • • •	▼ × × × × × × ×	Brake fluid level switch Brake fluid pressure detected by pressure sensor Operation status of front RH ABS IN valve Operation status of front RH ABS OUT valve Operation status of front LH ABS IN valve Operation status of front LH ABS IN valve Operation status of front LH ABS OUT valve Operation status of rear RH ABS IN valve Operation status of rear RH ABS OUT valve	

Revision: 2013 February

BRC-15

2012 Murano CrossCabriolet

DIAGNOSIS SYSTEM [ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)]

< SYSTEM DESCRIPTION >

[WITH VDC]

	SELECT MONITOR ITEM		
Monitor item (Unit)	ECU INPUT SIGNALS	MAIN SIGNALS	Remarks
RR LH IN SOL (On/Off)	▼	×	Operation status of rear LH ABS IN valve
RR LH OUT SOL (On/Off)	▼	×	Operation status of rear LH ABS OUT valve
MOTOR RELAY (On/Off)	▼	×	Motor and motor relay operation
ACTUATOR RLY (On/Off)	▼	×	Actuator relay operation
ABS WARN LAMP (On/Off)	▼	×	ABS warning lamp
OFF LAMP (On/Off)	▼	×	VDC OFF indicator lamp
SLIP/VDC LAMP (On/Off)	▼	×	VDC warning lamp
CV1 (On/Off)	▼	▼	Cut valve 1 (CV1) monitor
CV2 (On/Off)	▼	▼	Cut valve 2 (CV2) monitor
SV1 (On/Off)	▼	▼	Suction valve 1 (SV1) monitor
SV2 (On/Off)	▼	▼	Suction valve 2 (SV2) monitor
EBD SIGNAL (On/Off)	▼	▼	EBD operation
ABS SIGNAL (On/Off)	▼	▼	ABS operation
TCS SIGNAL (On/Off)	▼	▼	TCS operation
VDC SIGNAL (On/Off)	▼	▼	VDC operation
EBD FAIL SIG (On/Off)	▼	▼	EBD fail-safe status
ABS FAIL SIG (On/Off)	▼	▼	ABS fail-safe status
TCS FAIL SIG (On/Off)	▼	▼	TCS fail-safe status
VDC FAIL SIG (On/Off)	▼	▼	VDC fail-safe status
EBD WARN LAMP (On/Off)	▼	▼	Brake warning lamp
CRANKING SIG (On/Off)	▼	▼	Crank operation
4WD FAIL REQ (On/Off)	▼	▼	AWD fail-safe signal status
2WD/4WD (2WD/4WD)	▼	▼	Distinguish 2WD and AWD

NOTE:

A brief moment of On/Off condition occurs every 20 seconds after ignition switch turned ON. This is not malfunction because it is a operation for checking.

ACTIVE TEST MODE CAUTION:

DIAGNOSIS SYSTEM [ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)]

< SYSTEM DESCRIPTION >

- Never perform active test while driving vehicle.
- Make sure to completely bleed air from brake system.
- The active test cannot be started when ABS warning lamp, VDC warning lamp and brake warning lamp is ON.
- ABS warning lamp, VDC warning lamp and brake warning lamp are ON during active test.
 NOTE:
- When active test is performed while depressing the pedal, the pedal depression amount will change. This is normal. (Only solenoid valve and ABS motor.)
- "TEST IS STOPPED" in "ABS" with CONSULT is displayed 10 seconds after operation start.
- After "TEST IS STOPPED" in "ABS" with CONSULT is displayed, to perform test again.

Test Item

ABS SOLENOID VALVE

• Select "Up", "Keep" and "Down" of "ACTIVE TEST" in "ABS" with CONSULT. Then use screen monitor to check that solenoid valve operates as shown in the table below.

Teatitom	Display item	Display			
Test liem		Up	Keep	Down	BDC
	FR RH IN SOL	Off	On	On	
FR RH SOL	FR RH OUT SOL	Off	Off	On*	
FR LH SOL	FR LH IN SOL	Off	On	On	G
	FR LH OUT SOL	Off	Off	On*	
RR RH SOL	RR RH IN SOL	Off	On	On	
	RR RH OUT SOL	Off	Off	On*	— H
RR LH SOL	RR LH IN SOL	Off	On	On	
	RR LH OUT SOL	Off	Off	On*	

*: On for 1 to 2 seconds after the select, and then Off.

NOTE:

A brief moment of On/Off condition occurs every 20 seconds after ignition switch turned ON. This is not malfunction because it is a operation for checking.

ABS SOLENOID VALVE (ACT)

 Select "Up", "ACT UP" and "ACT KEEP" of "ACTIVE TEST" in "ABS" with CONSULT. Then use screen monitor to check that solenoid valve operates as shown in the table below.

Tast itom	Display itom	Display			L
lest tient	Display item	Up	ACT UP	ACT KEEP	
	FR RH IN SOL	Off	Off	Off	
FR RH ABS SOLENOID	FR RH OUT SOL	Off	Off	Off	IVI
(ACT)	CV1	Off	On	On	
	SV1	Off	On*	Off	Ν
	FR LH IN SOL	Off	Off	Off	
FR LH ABS SOLENOID	FR LH OUT SOL	Off	Off	Off	
(ACT)	CV2	Off	On	On	0
	SV2	Off	On*	Off	
	RR RH IN SOL	Off	Off	Off	P
RR RH ABS SOLENOID (ACT)	RR RH OUT SOL	Off	Off	Off	
	CV2	Off	On	On	
	SV2	Off	On*	Off	

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DIAGNOSIS SYSTEM [ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)]

< SYSTEM DESCRIPTION >

Test item	Display item	Display			
		Up	ACT UP	ACT KEEP	
RR LH ABS SOLENOID (ACT)	RR LH IN SOL	Off	Off	Off	
	RR LH OUT SOL	Off	Off	Off	
	CV1	Off	On	On	
	SV1	Off	On*	Off	

 $^{\ast}:$ On for 1 to 2 seconds after the select, and then Off.

NOTE:

A brief moment of On/Off condition occurs every 20 seconds after ignition switch turned ON. This is not malfunction because it is a operation for checking.

ABS MOTOR

Select "On" and "Off" of "ACTIVE TEST" in "ABS" with CONSULT. Make sure motor relay and actuator relay
operates as shown in table below.

Test item	Display item	Display		
		On	Off	
ABS MOTOR	MOTOR RELAY	On	Off	
	ACTUATOR RLY	On	On	

NOTE:

A brief moment of On/Off condition occurs every 20 seconds after ignition switch turned ON. This is not malfunction because it is a operation for checking.

ECU IDENTIFICATION

ABS actuator and electric unit (control unit) part number can be read.

[WITH VDC]

< ECU DIAGNOSIS INFORMATION >

ECU DIAGNOSIS INFORMATION ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

Reference Value

VALUES ON THE DIAGNOSIS TOOL

CAUTION:

The display shows the control unit calculation data, so a normal value might be displayed even in the event the output circuit (harness) is open or short-circuited.

	Display content	Data monitor		D
Monitor item		Condition	Reference value in normal operation	_
		Vehicle stopped	0 [km/h (MPH)]	E
FR LH SENSOR	Wheel speed	Vehicle running (Note 1)	Nearly matches the speedometer display (± 10% or less)	BR
		Vehicle stopped	0 [km/h (MPH)]	
FR RH SENSOR	Wheel speed	Vehicle running (Note 1)	Nearly matches the speedometer display (± 10% or less)	G
		Vehicle stopped	0 [km/h (MPH)]	
RR LH SENSOR	Wheel speed	Vehicle running (Note 1)	Nearly matches the speedometer display (± 10% or less)	I
	Wheel speed	Vehicle stopped	0 [km/h (MPH)]	J
RR RH SENSOR		Vehicle running (Note 1)	Nearly matches the speedometer display (± 10% or less)	K
	Brake pedal operation	When brake pedal is depressed	On	
STOP LAWF SW		When brake pedal is not depressed	Off	1
BATTERY VOLT	Battery voltage supplied to the ABS actuator and electric unit (control unit)	Ignition switch ON	10 – 16 V	
GEAR	Gear position	Vehicle running	1 – 6	M
	Soloct shift position	CVT shift position (R)	On	
K F 001 010		CVT shift position (other R)	Off	
	Select shift position	CVT shift position (N)	On	Ν
		CVT shift position (other N)	Off	
P POSI SIG	Select shift position	CVT shift position (P)	On	0
		CVT shift position (other P)	Off	0
SLCT LVR POSI	Select shift position	CVT shift position (P, R, N, D, L)	P R N D L	Ρ
		Manual mode	##	

[WITH VDC]

INFOID:000000007565749

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< ECU DIAGNOSIS INFORMATION >

[WITH VDC]

		Data monitor		
Monitor item	Display content	Condition	Reference value in normal operation	
		VDC OFF switch ON (When VDC OFF indicator lamp is ON)	On	
OFF SW	VDC OFF switch ON/OFF status	VDC OFF switch OFF (When VDC OFF indicator lamp is OFF)	Off	
		Vehicle stopped	Approx. 0 d/s	
YAW RATE SEN	Yaw rate detected by yaw rate/side/decel sensor	Vehicle running	-100 to 100 d/s	
	Decel G detected by yaw rate/side/decel G sen-	Vehicle stopped	Approx. 0 G	
DECEL G-SEN	sor	Vehicle running	–1.7 – +1.7 G	
	Open/Close condition of throttle valve	Accelerator pedal not depressed (Engine stopped)	0 %	
ACCEL POS SIG	(Linked with accelerator pedal)	Depress accelerator pedal (Engine stopped)	0 - 100 %	
	Transverse G detected by yaw rate/side/decel G	Vehicle stopped	Approx. 0 m/s ²	
SIDE G-SENSOR	sensor	Vehicle running	– 16.7 – 16.7 m/s ²	
		Driving straight	-3.5 - +3.5°	
STR ANGLE SIG	Steering angle detected by steering angle sen-	Turn 90 ° to right	Approx. +90 °	
		Turn 90 ° to left	Approx. –90 °	
		With engine stopped	0 [tr/min (rpm)]	
ENGINE RPM	With engine running	Engine running	Almost in accor- dance with ta- chometer display	
	Brake fluid level switch signal status	When brake fluid level switch ON	On	
FLUID LEV SW		When brake fluid level switch OFF	Off	
	Brake fluid pressure detected by pressure sen- sor	With ignition switch ON and brake pedal released	Approx. 0 bar	
PRESS SENSOR		With ignition switch ON and brake pedal depressed	0 – 170 bar	
	Operation status of front RH ABS IN valve	Actuator (ABS IN valve) is active ("AC- TIVE TEST" in "ABS" with CONSULT)	On	
(Note 2)		When the actuator (ABS IN valve) is not active and actuator relay is active (ignition switch ON)	Off	
FR RH OUT SOL	Operation status of front RH ABS OUT valve	Actuator (ABS OUT valve) is active ("ACTIVE TEST" in "ABS" with CON- SULT)	On	
(Note 2)		When the actuator (ABS OUT valve) is not active and actuator relay is active (ignition switch ON)	Off	
		Actuator (ABS IN valve) is active ("AC- TIVE TEST" in "ABS" with CONSULT)	On	
FR LH IN SOL (Note 2)	Operation status of front LH ABS IN valve	When the actuator (ABS IN valve) is not active and actuator relay is active (ignition switch ON)	Off	
FR LH OUT SOL		Actuator (ABS OUT valve) is active ("ACTIVE TEST" in "ABS" with CON- SULT)	On	
(Note 2)	Operation status of front LH ABS OUT valve	When the actuator (ABS OUT valve) is not active and actuator relay is active (ignition switch ON)	Off	

< ECU DIAGNOSIS INFORMATION >

[WITH VDC]

		Data monitor		
Monitor item	Display content	Condition	Reference value in A normal operation	
		Actuator (ABS IN valve) is active ("AC- TIVE TEST" in "ABS" with CONSULT)	On B	
(Note 2)	Operation status of rear RH ABS IN valve	When the actuator (ABS IN valve) is not active and actuator relay is active (ignition switch ON)	Off	
RR RH OUT SOL	Operation status of rear RH ABS OUT valve	Actuator (ABS OUT valve) is active ("ACTIVE TEST" in "ABS" with CON- SULT)	On	
(Note 2)		When the actuator (ABS OUT valve) is not active and actuator relay is active (ignition switch ON)	Off	
		Actuator (ABS IN valve) is active ("AC- TIVE TEST" in "ABS" with CONSULT)	On	
(Note 2)	Operation status of rear LH ABS IN valve	When the actuator (ABS IN valve) is not active and actuator relay is active (ignition switch ON)	Off	
RR LH OUT SOL	Operation status of rear LH ABS OUT valve	Actuator (ABS OUT valve) is active ("ACTIVE TEST" in "ABS" with CON- SULT)	On G	
(Note 2)		When the actuator (ABS OUT valve) is not active and actuator relay is active (ignition switch ON)	Off H	
	Motor and motor relay operation	Ignition switch ON or engine running (ABS operated)	On	
MOTOR RELAY		Ignition switch ON or engine running (ABS not operated)	Off	
ACTUATOR RLY	Actuator relay operation	Vehicle stopped (Engine running)	On J	
(Note 2)		Vehicle stopped (Ignition switch ON)	Off	
	ABS warning lamp	When ABS warning lamp is ON	On	
ABS WARN LAWP	(Note 3)	When ABS warning lamp is OFF	Off	
	VDC OFF indicator lamp	When VDC OFF indicator lamp is ON	On	
OFF LAMP	(Note 3)	When VDC OFF indicator lamp is OFF	Off	
		When VDC warning lamp is ON		
SLIP/VDC LAMP	VDC warning lamp	When VDC warning lamp is blinking	On M	
	(Note 3)	When VDC warning lamp is OFF	Off	
		Actuator (cut valve 1) is active ("AC- TIVE TEST" in "ABS" with CONSULT)	On	
CV1	Operation status of cut valve 1 (CV1)	When the actuator (cut valve 1) is not active and actuator relay is active (ignition switch ON)	Off	
		Actuator (cut valve 2) is active ("AC- TIVE TEST" in "ABS" with CONSULT)	On	
CV2	Operation status of cut valve 2 (CV2)	When the actuator (cut valve 2) is not active and actuator relay is active (ignition switch ON)	Off	

< ECU DIAGNOSIS INFORMATION >

[WITH VDC]

		Data monitor		
Monitor item	Display content	Condition	Reference value in normal operation	
\$\/1	Operation status of sustian value 1 (S)(1)	Actuator (suction valve 1) is active ("ACTIVE TEST" in "ABS" with CON- SULT)	On	
301		When the actuator (suction valve 1) is not active and actuator relay is active (ignition switch ON)	Off	
SV/2	Operation status of suction value 2 (SV/2)	Actuator (suction valve 2) is active ("ACTIVE TEST" in "ABS" with CON- SULT)	On	
572	Operation status of suction valve 2 (SV2)	When the actuator (suction valve 2) is not active and actuator relay is active (ignition switch ON)	Off	
	EPD eneration	EBD is active	On	
EBD SIGNAL		EBD is inactive	Off	
	ABS operation	ABS is active	On	
ABS SIGNAL		ABS is inactive	Off	
	TCS operation	TCS is active	On	
ICS SIGNAL		TCS is inactive	Off	
	VDC operation	VDC is active	On	
VDC SIGNAL		VDC is inactive	Off	
	EBD fail-safe signal	In EBD fail-safe	On	
EBD FAIL SIG		EBD is normal	Off	
	ABS fail-safe signal	In ABS fail-safe	On	
ADS FAIL SIG		ABS is normal	Off	
		In TCS fail-safe	On	
TCS FAIL SIG		TCS is normal	Off	
		In VDC fail-safe	On	
VDC FAIL SIG	VDC fail-safe signal	VDC is normal	Off	
	Brake warning lamp	When brake warning lamp is ON	On	
	(Note 3)	When brake warning lamp is OFF	Off	
		Crank is active	On	
CRAINKING SIG	Crank operation	Crank is inactive	Off	
	AWD fail status	AWD fail	On	
	AVVD TAIL STATUS	AWD normal	Off	
		2WD model	2WD	
2WD/4WD	Drive axle	AWD model	4WD	

NOTE:

• 1: Confirm tire pressure is normal.

• 2: A brief moment of On/Off condition occurs every 20 seconds after ignition switch turned ON. This is not malfunction because it is a operation for checking.

• 3: On and off timing for warning lamp and indicator lamp. Refer to BRC-11, "System Description".

Fail-Safe

INFOID:000000007565750

ABS, EBD SYSTEM

If ABS malfunction electrically, ABS warning lamp and VDC warning lamp will turn ON. If EBD malfunction electrically, brake warning lamp, ABS warning lamp and VDC warning lamp will turn ON. Simultaneously, the VDC/TCS/ABS become one of the following conditions of the fail-safe function.

BRC-22

< ECU DIAGNOSIS INFORMATION >

• For malfunction of ABS, only the EBD is activated and the condition of vehicle is the same condition of vehicles without TCS/ABS system. **NOTE:**

ABS self-diagnosis sound may be heard. That is a normal condition because a self-diagnosis for "Ignition switch ON" and "The first starting" are being performed.

For malfunction of EBD, EBD and ABS become inoperative, and the condition of vehicle is the same as the condition of vehicles without TCS/ABS, EBD system.

VDC/TCS

If VDC/TCS/ABS system malfunction electrically, VDC warning lamp is turned on, and the condition of vehicle is the same as the condition of vehicles without VDC/TCS control.

If the Fail-Safe function is activated, then perform self-diagnosis for "ABS" with CONSULT.

DTC Inspection Priority Chart

INFOID:000000007565751

[WITH VDC]

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When multiple DTCs are displayed simultaneously, check one by one depending on the following priority list.

Priority	Detected item (DTC)	
1	U1000 CAN COMM CIRCUIT U1002 SYSTEM COMM (CAN)	BRC
2	C1110 CONTROLLER FAILURE	0
3	C1130 ENGINE SIGNAL 1	G
4	C1109 BATTERY VOLTAGE [ABNORMAL] C1111 PUMP MOTOR C1140 ACTUATOR RLY	Н
	 C1101 RR RH SENSOR-1 C1102 RR LH SENSOR-1 C1103 FR RH SENSOR-1 C1104 FR LH SENSOR-1 C1105 RR RH SENSOR-2 C1106 RR LH SENSOR-2 C1107 FR RH SENSOR-2 C1107 FR RH SENSOR-2 C1108 FR LH SENSOR-2 	l J
5	 C1113 G SENSOR C1115 ABS SENSOR [ABNORMAL SIGNAL] C1116 STOP LAMP SW C1120 FR LH IN ABS SOL C1121 FR LH OUT ABS SOL C1122 FR RH IN ABS SOL C1122 FR RH IN ABS SOL 	K
	 C1123 FR RH OUT ABS SOL C1124 RR LH IN ABS SOL C1125 RR LH OUT ABS SOL C1126 RR RH IN ABS SOL C1127 RR RH OUT ABS SOL C1127 RR RH OUT ABS SOL C1142 PRESS SEN CIRCUIT 	Μ
	C1143 ST ANG SEN CIRCUIT C1144 ST ANG SEN SIGNAL C1145 YAW RATE SENSOR C1146 SIDE G-SEN CIRCUIT	Ν
	 C1160 DECEL G SEN SET C1161 SIDE G SEN SET C1162 PRESS SEN SET C1164 CV1 	0
	• C1165 CV2 • C1166 SV1 • C1167 SV2	Ρ
6	C1155 BR FLUID LEVEL LOW	_

< ECU DIAGNOSIS INFORMATION >

DTC No. Index

INFOID:000000007565752

[WITH VDC]

DTC	Items (CONSULT screen terms)	Reference
C1101	RR RH SENSOR-1	
C1102	RR LH SENSOR-1	PPC 25 "DTC Logio"
C1103	FR RH SENSOR-1	BRU-35, DIC LOGIC
C1104	FR LH SENSOR-1	
C1105	RR RH SENSOR-2	
C1106	RR LH SENSOR-2	PPC 28 "DTC Logio"
C1107	FR RH SENSOR-2	BRC-36, DTC Logic
C1108	FR LH SENSOR-2	
C1109	BATTERY VOLTAGE [ABNORMAL]	BRC-43, "DTC Logic"
C1110	CONTROLLER FAILURE	BRC-45, "DTC Logic"
C1111	PUMP MOTOR	BRC-46, "DTC Logic"
C1113	G SENSOR	BRC-48, "DTC Logic"
C1115	ABS SENSOR [ABNORMAL SIGNAL]	BRC-50, "DTC Logic"
C1116	STOP LAMP SW	BRC-55, "DTC Logic"
C1120	FR LH IN ABS SOL	BRC-57, "DTC Logic"
C1121	FR LH OUT ABS SOL	BRC-59, "DTC Logic"
C1122	FR RH IN ABS SOL	BRC-57, "DTC Logic"
C1123	FR RH OUT ABS SOL	BRC-59, "DTC Logic"
C1124	RR LH IN ABS SOL	BRC-57, "DTC Logic"
C1125	RR LH OUT ABS SOL	BRC-59, "DTC Logic"
C1126	RR RH IN ABS SOL	BRC-57, "DTC Logic"
C1127	RR RH OUT ABS SOL	BRC-59, "DTC Logic"
C1130	ENGINE SIGNAL 1	BRC-61, "DTC Logic"
C1140	ACTUATOR RLY	BRC-62, "DTC Logic"
C1142	PRESS SEN CIRCUIT	BRC-64, "DTC Logic"
C1143	ST ANG SEN CIRCUIT	BRC-65, "DTC Logic"
C1144	ST ANG SEN SIGNAL	BRC-67, "DTC Logic"
C1145	YAW RATE SENSOR	BRC-48 "DTC Logic"
C1146	SIDE G-SEN CIRCUIT	<u>BRO 40, BTO Logic</u>
C1155	BR FLUID LEVEL LOW	BRC-68, "DTC Logic"
C1160	DECEL G SEN SET	BRC-71, "DTC Logic"
C1161	SIDE G SEN SET	BRC-72, "DTC Logic"
C1162	PRESS SEN SET	BRC-73, "DTC Logic"
C1164	CV1	BRC-74 "DTC Logic"
C1165	CV2	
C1166	SV1	BRC-76 "DTC Logic"
C1167	SV2	BIGHU, BIGLOUIC
U1000	CAN COMM CIRCUIT	BRC-78, "DTC Logic"
U1002	SYSTEM COMM (CAN)	BRC-79, "DTC Logic"

WIRING DIAGRAM BRAKE CONTROL SYSTEM

Wiring Diagram

For connector terminal arrangements, harness layouts, and alphabets in a \bigcirc (option abbreviation; if not described in wiring diagram), refer to <u>GI-12, "Connector Information"</u>.



Revision: 2013 February

INFOID:000000007565753

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[WITH VDC]

BASIC INSPECTION DIAGNOSIS AND REPAIR WORK FLOW

Work Flow

INFOID:000000007565754

PRECAUTIONS FOR DIAGNOSIS

Adjustment of Steering Angle Sensor

If steering angle sensor, steering system parts, suspension system parts, ABS actuator and electric unit (control unit) or tires have been replaced, or if wheel alignment has been adjusted, be sure to adjust neutral position of steering angle sensor before driving. Refer to <u>BRC-31</u>, "<u>Description</u>".

Calibration of Decel G Sensor

If yaw rate/side/decel G sensor or ABS actuator and electric unit (control unit) have been replaced, be sure to calibrate decel G sensor before driving. Refer to <u>BRC-33</u>, "<u>Description</u>".

DIAGNOSIS AND REPAIR WORK FLOW

< BASIC INSPECTION >

[WITH VDC]

OVERALL SEQUENCE



1.COLLECT THE INFORMATION FROM THE CUSTOMER

Get the detailed information from the customer about the symptom (the condition and the environment when the incident/malfunction occurred) using the diagnosis worksheet. Refer to <u>BRC-29</u>, "<u>Diagnostic Work Sheet</u>".

>> GO TO 2.

DIAGNOSIS AND REPAIR WORK FLOW

< BASIC INSPECTION >

[WITH VDC]

2. PERFORM SELF-DIAGNOSIS

Perform self-diagnosis with CONSULT.

Is there any DTC displayed?

YES >> Record or print self-diagnosis results and freeze frame data (FFD). GO TO 3.

NO >> GO TO 4.

3. PERFORM THE SYSTEM DIAGNOSIS

Perform the diagnosis applicable to the displayed DTC of "ABS" with CONSULT. Refer to <u>BRC-24, "DTC No.</u> Index".

>> GO TO 7.

4.CHECK THE SYMPTOM THAT IS NOT CONSIDERED A SYSTEM MALFUNCTION

Check that the symptom is a normal operation that is not considered a system malfunction. Refer to <u>BRC-97.</u> "Description".

Is the symptom a normal operation?

YES >> GO TO 8.

NO >> GO TO 5.

5. Check the warning lamp and indicator lamp for illumination

Check that the warning lamp and indicator lamp illuminate. Refer to <u>BRC-11, "System Description"</u>.

Is ON/OFF timing normal?

YES >> GO TO 6. NO >> GO TO 2.

6.PERFORM THE DIAGNOSIS BY SYMPTOM

Perform the diagnosis applicable to the symptom for "ABS" with CONSULT.

>> GO TO 7.

7.REPAIR OR REPLACE THE MALFUNCTIONING PARTS

Repair or replace the specified malfunctioning parts.

>> GO TO 8.

8.MEMORY CLEAR

Perform self-diagnosis memory clear for "ABS" with CONSULT.

>> GO TO 9.

9.FINAL CHECK

Perform the self-diagnosis again, and check that the malfunction is repaired completely.

Is no other DTC present and the repair completed?

YES >> INSPECTION END NO >> GO TO 3.

DIAGNOSIS AND REPAIR WORK FLOW

< BASIC INSPECTION >

Diagnostic Work Sheet

INFOID:000000007565755

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Customer name MR/MS	Model & Year		VIN	
Engine #	Trans.		Mileage	
Incident Date	Manuf. Date		In Service Date	
Symptoms	 Noise and vibration (from engine compartment) Noise and vibration (from axle) 	U Warning / Indicator activate	☐ Firm pedal operation Large stroke pedal operation	
	TCS does not work (Rear wheels slip when accelerating)	ABS does not work (Wheels lock when braking)	Lack of sense of acceleration	
Engine conditions	□ When starting □ After starting			
Road conditions	□ Low friction road (□Snow □Gra □ Bumps / potholes	Low friction road (Snow Gravel Other) Bumps / potholes		
Driving conditions	Full-acceleration High speed cornering Vehicle speed: Greater than 10 k Vehicle speed: 10 km/h (6 MPH) Vehicle is stopped	□ Full-acceleration □ High speed cornering □ Vehicle speed: Greater than 10 km/h (6 MPH) □ Vehicle speed: 10 km/h (6 MPH) or less □ Vehicle is stopped		
Applying brake conditions	□ Suddenly □ Gradually			
Other conditions	Operation of electrical equipment Shift change Other descriptions	t		

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ADDITIONAL SERVICE WHEN REPLACING ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< BASIC INSPECTION >

[WITH VDC]

ADDITIONAL SERVICE WHEN REPLACING ABS ACTUATOR AND ELEC-TRIC UNIT (CONTROL UNIT)

Description

INFOID:000000007565756

Perform the steering angle sensor adjustment and decel G sensor calibration after replacing the ABS actuator and electric unit (control unit).

Special Repair Requirement

INFOID:000000007565757

1.PERFORM ADJUSTMENT OF STEERING ANGLE SENSOR AND CALIBRATION OF DECEL G SENSOR

Perform steering angle sensor adjustment and decel G sensor calibration.

- Adjustment of steering angle sensor: Refer to <u>BRC-31, "Description"</u>.
- Calibration of decel G sensor: Refer to BRC-33, "Description".

>> INSPECTION END

ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION < BASIC INSPECTION > [WITH VDC]

ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Description

INFOID:000000007565758

А

When doing work that applies to the list below, make sure to adjust neutral position of steering angle sensor Before running vehicle.

	×: Required –: Not required
Situation	Adjustment of steering angle sensor neutral position
Removing/Installing ABS actuator and electric unit (control unit)	
Replacing ABS actuator and electric unit (control unit)	×
Removing/Installing steering angle sensor	× D
Replacing steering angle sensor	×
Removing/Installing steering components	×
Replacing steering components	x
Removing/Installing suspension components	×
Replacing suspension components	×
Change tires to new ones	
Tire rotation	_
Adjusting wheel alignment	G
Work Procedure	
CAUTION: To adjust neutral position of steering angle sensor, (Adjustment cannot be done without CONSULT.)	make sure to use CONSULT.
1. ALIGN THE VEHICLE STATUS	
Stop the vehicle with front wheels in straight-ahead pos	ition.
>> GO TO 2. 2. PERFORM THE NEUTRAL POSITION ADJUSTME	NT FOR THE STEERING ANGLE SENSOR
 Select "ABS", "WORK SUPPORT" and "ST ANGLE Select "START". CAUTION: Never touch steering wheel while adjusting steering 	SENSOR ADJUSTMENT" in order with CONSULT.
3. After approximately 10 seconds, select "END". NOTE:	M
 After approximately 60 seconds, it ends automatica 4. Turn the ignition switch OFF, then turn it ON again. CAUTION: Be sure to perform above operation. 	ally. N
>> GO TO 3. 3. CHECK DATA MONITOR	0
 Run the vehicle with front wheels in straight-ahead Select "ABS", "DATA MONITOR" and "STR ANGLE angle sensor signal. 	position, then stop. $$P$$ SIG" in order with CONSULT, and check the steering

STR ANGLE SIG $: 0\pm 3.5^{\circ}$

Is the steering angle within the specified range?

- YES >> GO TO 4.
- NO >> Perform the neutral position adjustment for the steering angle sensor again, GO TO 1.

BRC-31

ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

< BASIC INSPECTION >

[WITH VDC]

4. ERASE THE SELF-DIAGNOSIS MEMORY

Erase the self-diagnosis memories for "ABS" with CONSULT. Refer to <u>BRC-14. "CONSULT Function"</u>. <u>Are the memories erased?</u>

- YES >> INSPECTION END
- NO >> Check the items indicated by the self-diagnosis.

CALIBRATION OF DECEL G SENSOR

< BASIC INSPECTION >

CALIBRATION OF DECEL G SENSOR

Description

When doing work that applies to the list below, make sure to calibration of decel G sensor before running vehicle.

	×: Required –: Not required
Situation	Calibration of decel G sensor
Removing/Installing ABS actuator and electric unit (control unit)	×
Replacing ABS actuator and electric unit (control unit)	×
Removing/Installing steering components	
Removing/Installing suspension components	
Change tires to new ones	
Tire rotation	
Adjusting wheel alignment	
Removing/Installing yaw rate/side/decel G sensor	х В
Replacing yaw rate/side/decel G sensor	X
Nork Procedure	INFOID:00000007565761
CALIBRATION OF DECEL G SENSOR CAUTION: To calibrate decel G sensor, make sure to use CONS (Calibration cannot be done without CONSULT.) Perform the G sensor calibration only with the vehic	ULT. le parked on level surface.
1.ALIGN THE VEHICLE STATUS	
 Keep all tires inflated to correct pressures. Adjust the Check that there is specified-load in vehicle other driver's position). >> GO TO 2. 	e tire pressure to the specified pressure value. than the driver (or equivalent weight placed in
2.PERFORM THE CALIBRATION OF DECEL G SENSO	R
 Select "ABS", "WORK SUPPORT" and "DECEL G SE Select "START". After approximately 10 seconds, select "END". NOTE: 	N CALIBRATION" in order with CONSULT.
After approximately 60 seconds, it ends automatically. Turn the ignition switch OFF, then turn it ON again. CAUTION: Be sure to perform above operation.	
>> GO TO 3.	(
3. CHECK DATA MONITOR	
 Run the vehicle with front wheels in straight-ahead po Select "ABS", "DATA MONITOR" and "DECEL G-SE sensor signal. 	sition, then stop. N" in order with CONSULT, and check the decel G

DECEL G-SEN : ±0.08 G

Is the yaw rate/side/decel G within the specified range?

YES >> GO TO 4.

INFOID:000000007565760

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< BASIC INSPECTION >

NO >> Perform the calibration of decel G sensor again, GO TO 1.

4. ERASE THE SELF-DIAGNOSIS MEMORY

Erase the self-diagnosis memories for "ABS" with CONSULT. Refer to BRC-14, "CONSULT Function".

Are the memories erased?

- YES >> INSPECTION END
- NO >> Check the items indicated by the self-diagnosis.

C1101, C1102, C1103, C1104 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

DTC/CIRCUIT DIAGNOSIS

C1101, C1102, C1103, C1104 WHEEL SENSOR

DTC Logic

INFOID:000000007565762

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DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause	0
C1101	RR RH SENSOR-1	Circuit of rear RH wheel sensor is open or short circuit. Current signal from sensor is outside limits.	 Harness or connector Wheel sensor 	D
C1102	RR LH SENSOR-1	Circuit of rear LH wheel sensor is open or short circuit. Current signal from sensor is outside limits.		
C1103	FR RH SENSOR-1	Circuit of front RH wheel sensor is open or short circuit. Current signal from sensor is outside limits.	ABS actuator and electric unit (control unit)	E
C1104	FR LH SENSOR-1	Circuit of front LH wheel sensor is open or short circuit. Current signal from sensor is outside limits.		BRO

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn the ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.	
2. DTC REPRODUCTION PROCEDURE	
 Start the engine and drive the vehicle at 30 km/h (19 MPH) or more for approximately 1 minute. Perform self-diagnosis for "ABS" with CONSULT. 	I
<u>Is DTC "C1101", "C1102", "C1103" or "C1104" detected?</u>	
 YES >> Proceed to diagnosis procedure. Refer to <u>BRC-35, "Diagnosis Procedure"</u>. NO >> INSPECTION END 	J
Diagnosis Procedure	K
CAUTION: Never check the between wheel sensor harness connector terminals. 1.CHECK WHEEL SENSOR	L
 Turn the ignition switch OFF. Check the wheel sensor for damage. Is the inspection result normal? 	M
YES >> GO TO 3. NO >> GO TO 2.	N
2.REPLACE WHEEL SENSOR (1)	
 Replace wheel sensor. Front: Refer to <u>BRC-98, "FRONT WHEEL SENSOR : Exploded View"</u>. Rear: Refer to <u>BRC-99, "REAR WHEEL SENSOR : Exploded View"</u>. 2. Erson solf diagnosis requit for "ARS". 	0
 Turn the ignition switch OFF, and wait 10 seconds or more. 	Ρ
 Start the engine. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute. Stop the vehicle. Perform solt diagnosis for "APS" with CONSULT. 	
Is DTC "C1101". "C1102". "C1103" or "C1104" detected?	

YES >> GO TO 3.

NO >> INSPECTION END

BRC-35

[WITH VDC]

C1101, C1102, C1103, C1104 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

3. CHECK CONNECTOR

- 1. Turn the ignition switch OFF.
- 2. Check the ABS actuator and electric unit (control unit) harness connector for disconnection or looseness.
- 3. Check the wheel sensor harness connector for disconnection or looseness.

Is the inspection result normal?

- YES >> GO TO 5.
- NO >> Repair or replace error-detected parts, securely lock the harness connector, and GO TO 4.

4.PERFORM SELF-DIAGNOSIS (1)

- 1. Erase self-diagnosis result for "ABS" with CONSULT.
- 2. Turn the ignition switch OFF, and wait 10 seconds or more.
- 3. Start the engine.
- 4. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
- 5. Stop the vehicle.
- 6. Perform self-diagnosis for "ABS" with CONSULT.

Is DTC "C1101", "C1102", "C1103" or "C1104" detected?

- YES >> GO TO 5.
- NO >> INSPECTION END

5.CHECK TERMINAL

- 1. Turn the ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) harness connector and then check the ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness connector.
- 3. Disconnect wheel sensor harness connector and check the each wheel sensor pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

- YES >> GO TO 7.
- NO >> Repair or replace error-detected parts and GO TO 6.

6. PERFORM SELF-DIAGNOSIS (2)

- 1. Connect ABS actuator and electric unit (control unit) harness connector.
- 2. Connect wheel sensor harness connector.
- 3. Erase self-diagnosis result for "ABS".
- 4. Turn the ignition switch OFF, and wait 10 seconds or more.
- 5. Start the engine.
- 6. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
- 7. Stop the vehicle.
- 8. Perform self-diagnosis for "ABS" with CONSULT.

Is DTC "C1101", "C1102", "C1103" or "C1104" detected?

NO >> INSPECTION END

7.CHECK WHEEL SENSOR HARNESS

- 1. Turn the ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) harness connector.
- 3. Disconnect wheel sensor harness connector.
- 4. Check the continuity between ABS actuator and electric unit (control unit) harness connector and wheel sensor harness connector. (Check the continuity when steering wheel is steered to RH and LH, or center harness in wheel housing is moved.)
C1101, C1102, C1103, C1104 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

ABS actuator and ele	ctric unit (control unit)	Wheel sensor		
Connector	Terminal	Connector	Terminal	Continuity
	9	E22 (Front LH wheel)	1	
E26	5	E39 (Front RH wheel)	3	Eviated
230	3	C5 (Rear LH wheel)	5	Existed
-	11	C6 (Rear RH wheel)	7	
Measurement connect	tor and terminal for signal	l circuit		
ABS actuator and ele	ctric unit (control unit)	Wheel ser	nsor	Continuity
Connector	Terminal	Connector	Terminal	Continuity
	8	E22 (Front LH wheel)	2	
Fac	6	E39 (Front RH wheel)	4	Eviatori
E30	2	C5 (Rear LH wheel)	6	EXISTED
	12	C6 (Rear RH wheel)	8	-
Connect ABS ac Connect wheel s Erase self-diagn Turn the ignition	ctuator and electric usensor harness connosis result for "ABS switch OFF, and wa	unit (control unit) harnes nector. ". ait 10 seconds or more.	s connector.	
Connect ABS ac Connect wheel s Erase self-diagn Turn the ignition Start the engine. Drive the vehicle Stop the vehicle Perform self-diag <u>DTC "C1101", "C1</u> (ES >> GO TO S VO >> INSPEC	tuator and electric usensor harness connosis result for "ABS switch OFF, and wa at approx. 30 km/h gnosis for "ABS" wit 102", "C1103" or "C 9. TION END	unit (control unit) harnes nector. ". ait 10 seconds or more. n (19 MPH) or more for a n CONSULT. <u>1104" detected?</u>	s connector. approx. 1 minute.	
Connect ABS ac Connect wheel s Erase self-diagn Turn the ignition Start the engine. Drive the vehicle Stop the vehicle Perform self-dia DTC "C1101", "C1 ES >> GO TO S IO >> INSPEC REPLACE WHEE Replace wheel s Front: Refer to B Erase self-diagn	tuator and electric usensor harness connosis result for "ABS switch OFF, and wa e at approx. 30 km/h gnosis for "ABS" wit 102", "C1103" or "C 9. TION END EL SENSOR (2) Sensor. BRC-98, "FRONT W RC-99, "REAR WH iosis result for "ABS	unit (control unit) harnes nector. ". ait 10 seconds or more. n (19 MPH) or more for a th CONSULT. <u>1104" detected?</u> <u>(HEEL SENSOR : Explote</u> <u>" with CONSULT.</u>	s connector. approx. 1 minute. ded View". ad View".	
Connect ABS ac Connect wheel s Erase self-diagn Turn the ignition Start the engine. Drive the vehicle Stop the vehicle Perform self-diagn DTC "C1101", "C1 (ES >> GO TO s IO >> INSPEC REPLACE WHEE Replace wheel s Front: Refer to B Erase self-diagn Turn the ignition Start the engine. Drive the vehicle Stop the vehicle Perform self-diagn	tuator and electric usensor harness connosis result for "ABS switch OFF, and wa at approx. 30 km/h gnosis for "ABS" wit <u>102", "C1103" or "C</u> 9. TION END EL SENSOR (2) Sensor. <u>BRC-99, "FRONT W</u> RC-99, "REAR WH osis result for "ABS switch OFF, and wa at approx. 30 km/h gnosis for "ABS" wit	unit (control unit) harnes nector. ". ait 10 seconds or more. n (19 MPH) or more for a th CONSULT. <u>1104" detected?</u> <u>(HEEL SENSOR : Explode</u> " with CONSULT. ait 10 seconds or more. n (19 MPH) or more for a	s connector. approx. 1 minute. ded View". ed View".	

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< DTC/CIRCUIT DIAGNOSIS >

C1105, C1106, C1107, C1108 WHEEL SENSOR

DTC Logic

INFOID:000000007565764

INFOID:000000007565765

[WITH VDC]

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1105	RR RH SENSOR-2	Signal from rear RH wheel sensor does not match other 3 wheel speed signal.	Harness or connectorWheel sensorSensor rotor
C1106	RR LH SENSOR-2	Signal from rear LH wheel sensor does not match other 3 wheel speed signal.	
C1107	FR RH SENSOR-2	Signal from front RH wheel sensor does not match other 3 wheel speed signal.	ABS actuator and electric unit (control unit) Sonsor rotor
C1108	FR LH SENSOR-2	Signal from front LH wheel sensor does not match other 3 wheel speed signal.	

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn the ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

- 1. Start the engine and drive the vehicle at 30 km/h (19 MPH) or more for approximately 1 minute.
- 2. Perform self-diagnosis for "ABS" with CONSULT.

Is DTC "C1105", "C1106", "C1107" or "C1108" detected?

- YES >> Proceed to diagnosis procedure. Refer to <u>BRC-38, "Diagnosis Procedure"</u>.
- NO >> INSPECTION END

Diagnosis Procedure

CAUTION:

Never check the between wheel sensor harness connector terminals.

1.CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) POWER SUPPLY SYSTEM

Check the ABS actuator and electric unit (control unit) power supply system. Refer to <u>BRC-81, "Diagnosis Pro-</u> cedure".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected parts.

2.CHECK TIRE

1. Turn the ignition switch OFF.

2. Check the tire air pressure, wear and size. Refer to <u>WT-49, "Tire Air Pressure"</u>.

Is the inspection result normal?

YES >> GO TO 5.

NO >> Adjust air pressure or replace tire and GO TO 3.

3.CHECK DATA MONITOR (1)

- 1. Erase self-diagnosis result for "ABS" with CONSULT.
- 2. Turn the ignition switch OFF, and wait 10 seconds or more.
- 3. Start the engine.
- Select "ABS" and "DATA MONITOR", check the "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR" and "RR RH SENSOR" with CONSULT. NOTE:

Set the "DATA MONITOR" recording speed to "10 msec".

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[WITH VDC]

< DTC/CIRCUIT DIAGNOSIS >	[WITH VDC]
5. Read a value (wheel speed) of both normal wheel sensors and error-detecting wheel sensors and error-detecting wheel sensors and error-detecting wheel sensors are speed detected by the	or. error detecting A
wheel sensor and the maximum/minimum wheel speed detected by the normal wheel senso	rs, is the differ-
ence within 5%, respectively? YES >> GO TO 4	В
NO >> GO TO 5.	D
4.PERFORM SELF-DIAGNOSIS (1)	
1. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.	C
 Stop the vehicle. Perform self-diagnosis for "ABS" with CONSULT. 	
Is DTC "C1105", "C1106", "C1107" or "C1108" detected?	D
YES >> GO TO 5.	
5-CHECK WHEEL SENSOR	E
1 Turn the ignition switch OFF	
 Check the wheel sensor for damage. 	BR
 Remove dust and foreign matter adhered to the sensor rotor with a vacuum dust collec wheel sensor mounting hole. 	tor through the
CAUTION:	
Install wheel sensor with no backlash and float, and tighten the mounting bolt to torque.	the specified
Front: Refer to <u>BRC-98</u> , "FRONT WHEEL SENSOR : Exploded View".	
• Rear: Refer to <u>BRC-99, REAR WHEEL SENSOR : Exploded view</u> .	Н
YES >> GO TO 8.	
NO >> GO TO 6.	I
D .REPLACE WHEEL SENSOR (1)	
1. Replace wheel sensor.	J
 Rear: Refer to <u>BRC-99, "REAR WHEEL SENSOR : Exploded View"</u>. 	
 Erase self-diagnosis result for "ABS" with CONSULT. Turn the ignition switch OFE and wait 10 seconds or more 	k
 Start the engine. 	
 Select "ABS" and "DATA MONITOR", check the "FR LH SENSOR", "FR RH SENSOR", "RI and "RR RH SENSOR" with CONSULT 	R LH SENSOR"
NOTE:	L
Set the "DATA MONITOR" recording speed to "10 msec". 6 Read a value (wheel speed) of both normal wheel sensors and error-detecting wheel sens	sor
Regarding the deference at 30 km/h (19 MPH) between the wheel speed detected by the	error detecting
wheel sensor and the maximum/minimum wheel speed detected by the normal wheel senso	rs, is the differ-
$\frac{\text{ence within 5\%, respectively?}}{\text{YES}} > \text{GO TO 7}$	Ν
NO >> GO TO 19.	
7.PERFORM SELF-DIAGNOSIS (2)	
With CONSULT.	
 Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute. Stop the vehicle 	
 Perform self-diagnosis for "ABS" with CONSULT. 	P
Is DTC "C1105", "C1106", "C1107" or "C1108" detected?	
YES >> GO TO 19. NO >> INSPECTION END	
8. CHECK CONNECTOR	
1 Turn the ignition switch OFF	
2. Check the ABS actuator and electric unit (control unit) harness connector for disconnection	n or looseness.

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< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

3. Check the wheel sensor harness connector for disconnection or looseness.

Is the inspection result normal?

YES >> GO TO 11.

NO >> Repair or replace error-detected parts, securely lock the harness connector, and GO TO 9.

9.CHECK DATA MONITOR (2)

1. Erase self-diagnosis result for "ABS" with CONSULT.

- 2. Turn the ignition switch OFF, and wait 10 seconds or more.
- 3. Start the engine.
- Select "ABS" and "DATA MONITOR", check the "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR" and "RR RH SENSOR" with CONSULT. NOTE:

Set the "DATA MONITOR" recording speed to "10 msec".

5. Read a value (wheel speed) of both normal wheel sensors and error-detecting wheel sensor.

Regarding the deference at 30 km/h (19 MPH) between the wheel speed detected by the error detecting wheel sensor and the maximum/minimum wheel speed detected by the normal wheel sensors, is the difference within 5%, respectively?

YES >> GO TO 10.

NO >> GO TO 11.

10. PERFORM SELF-DIAGNOSIS (3)

- 1. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
- 2. Stop the vehicle.
- 3. Perform self-diagnosis for "ABS" with CONSULT.

Is DTC "C1105", "C1106", "C1107" or "C1108" detected?

YES >> GO TO 11.

NO >> INSPECTION END

11.CHECK TERMINAL

- 1. Turn the ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) harness connector and then check the ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness connector.
- 3. Disconnect wheel sensor harness connector and check the each wheel sensor pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

- YES >> GO TO 14.
- NO >> Repair or replace error-detected parts and GO TO 12.
- 12.CHECK DATA MONITOR (3)
- 1. Connect ABS actuator and electric unit (control unit) harness connector.
- 2. Connect wheel sensor harness connector.
- 3. Erase self-diagnosis result for "ABS" with CONSULT.
- 4. Turn the ignition switch OFF, and wait 10 seconds or more.
- 5. Start the engine.
- Select "ABS" and "DATA MONITOR", check the "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR" and "RR RH SENSOR" with CONSULT. NOTE:

Set the "DATA MONITOR" recording speed to "10 msec".

7. Read a value (wheel speed) of both normal wheel sensors and error-detecting wheel sensor.

Regarding the deference at 30 km/h (19 MPH) between the wheel speed detected by the error detecting wheel sensor and the maximum/minimum wheel speed detected by the normal wheel sensors, is the difference within 5%, respectively?

YES >> GO TO 13.

NO >> GO TO 14.

13.PERFORM SELF-DIAGNOSIS (4)

- 1. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
- 2. Stop the vehicle.
- 3. Perform self-diagnosis for "ABS" with CONSULT.

	C1105, C1106,	C1107, C1108	3 WHEEL SENSOR	
< DTC/CIRCUIT DI	AGNOSIS >			[WITH VDC]
Is DTC "C1105", "C1	106", "C1107" or "C11	08" detected?		
YES >> GO TO '	14. TION END			A
		e		
		5		В
2. Disconnect ABS	actuator and electric	unit (control unit) h	arness connector.	
3. Disconnect whee	el sensor harness con	nector.		
4. Check the continground.	nuity between ABS a	ctuator and electri	c unit (control unit) names	is connector and the
ABS actuator and ele	ctric unit (control unit)			D
Connector	Terminal	—	Continuity	
	9, 8			E
	5, 6			E
E36	3, 2	Ground	Not existed	
	11, 12			BR
Is the inspection resu	ult normal?			
YES >> GO TO '	15.			G
15 our ok parta	or replace error-detecte	ed parts and GO TO	J 15.	0
I J.CHECK DATA	MONITOR (4)			
 Connect ABS ac Connect wheel s 	tuator and electric uni	t (control unit) harr	iess connector.	Н
3. Erase self-diagn	osis result for "ABS" v	vith CONSULT.		
4. Turn the ignition	switch OFF, and wait	10 seconds or mor	e.	
 Select "ABS" and 	d "DATA MONITOR", o	check the "FR LH S	ENSOR", "FR RH SENSOF	R", "RR LH SENSOR"
and "RR RH SEI	NSOR" with CONSUL	T.		
Set the "DATA M	10NITOR" recording s	peed to "10 msec".		J
7. Read a value (w	heel speed) of both no	ormal wheel senso	rs and error-detecting whee	l sensor.
Regarding the defer	<u>ence at 30 km/h (19</u>	MPH) between th	e wheel speed detected b	y the error detecting K
wheel sensor and the	<u>e maximum/minimum</u> pectivelv?	wheel speed dete	ected by the normal wheel	sensors, is the differ-
YES >> GO TO '	16.			1
NO >> GO TO '	17.			L
16. PERFORM SEI	LF-DIAGNOSIS (5)			
1. Drive the vehicle	e at approx. 30 km/h (*	19 MPH) or more fo	or approx. 1 minute.	M
2. Stop the vehicle.	anosis for "ABS" with (
Is DTC "C1105" "C1	106" "C1107" or "C11	08" detected?		Ν
YES >> GO TO '	17.	<u></u>		
NO >> INSPEC	TION END			
1 <i>1</i> . REPLACE WHI	EEL SENSOR (2)			0
1. Replace wheel s	ensor.			
 Front: Refer to B Rear: Refer to B 	<u>8RC-98, "FRONT WHI</u> RC-99 "REAR WHEF	<u>= EL SENSOR : EX</u> EL SENSOR : Expl	<u>pioded View"</u> . oded View"	Р
2. Erase self-diagn	osis result for "ABS" v	vith CONSULT.	<u>i i i i i i i i i i i i i i i i i i i </u>	
3. Turn the ignition	switch OFF, and wait	10 seconds or mor	e.	
5. Select "ABS" and	d "DATA MONITOR". d	check the "FR LH S	ENSOR", "FR RH SENSOF	R", "RR LH SENSOR"
and "RR RH SEI	NSOR" with CONSUL	T.		
Set the "DATA N	IONITOR" recording s	peed to "10 msec".		

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< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

6. Read a value (wheel speed) of both normal wheel sensors and error-detecting wheel sensor.

Regarding the deference at 30 km/h (19 MPH) between the wheel speed detected by the error detecting wheel sensor and the maximum/minimum wheel speed detected by the normal wheel sensors, is the difference within 5%, respectively?

- YES >> GO TO 18.
- NO >> GO TO 19.
- **18.**PERFORM SELF-DIAGNOSIS (6)
- 1. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
- 2. Stop the vehicle.
- 3. Perform self-diagnosis for "ABS" with CONSULT.
- Is DTC "C1105", "C1106", "C1107" or "C1108" detected?

YES >> GO TO 19.

NO >> INSPECTION END

19.REPLACE SENSOR ROTOR

- 1. Replace sensor rotor.
- Front: Refer to <u>BRC-101, "FRONT SENSOR ROTOR : Exploded View"</u>.
- Rear: Refer to <u>BRC-101, "REAR SENSOR ROTOR : Exploded View"</u>.
- 2. Erase self-diagnosis result for "ABS" with CONSULT.
- 3. Turn the ignition switch OFF, and wait 10 seconds or more.
- 4. Start the engine.
- 5. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
- 6. Stop the vehicle.
- 7. Perform self-diagnosis for "ABS" with CONSULT.
- Is DTC "C1105", "C1106", "C1107" or "C1108" detected?
- YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-102, "Exploded View"</u>.
- NO >> INSPECTION END

C1109 POWER AND GROUND SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

C1109 POWER AND GROUND SYSTEM

DTC Logic

DTC DE	TECTION LOGIC			
DTC	Display item	Malfunction detected condition	Possible cause	
C1109	BATTERY VOLTAGE [ABNORMAL]	ABNORMAL] When the ABS actuator and electric unit (control unit) power supply is lower than normal. • Harness or connected • ABS actuator and electric unit (control unit) • Fuse		
DTC CC	NFIRMATION PROCE	DURE		
1.PREC	CONDITIONING			
If "DTC 0 and wait	CONFIRMATION PROCE at least 10 seconds befor >> GO TO 2.	DURE" has been previously conducted, always e conducting the next test.	turn the ignition switch OFF	
2.DTC	REPRODUCTION PROCI	EDURE		
1. Turn 2. Perfe Is DTC "	the ignition switch OFF to orm self-diagnosis for "AB C1109" detected?	o ON. S" with CONSULT.		
YES NO	>> Proceed to diagnosis >> INSPECTION END	procedure. Refer to <u>BRC-43. "Diagnosis Procee</u>	<u>dure"</u> .	
Diagno	sis Procedure		INFOID:00000007565767	

- 1.CHECK CONNECTOR
- Turn the ignition switch OFF. 1.
- Disconnect ABS actuator and electric unit (control unit) harness connector. 2.
- 3. Check the terminal for deformation, disconnection, looseness, etc.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected parts.

2.CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) POWER SUPPLY

1. Check the voltage between ABS actuator and electric unit (control unit) harness connector and ground.

ABS actuator and ele	ectric unit (control unit)		Voltage
Connector	Terminal		(Approx.)
E36	1	Ground	Battery voltage

2. Turn the ignition switch ON. **CAUTION:**

Never start the engine.

3. Check the voltage between ABS actuator and electric unit (control unit) harness connector and ground.

ABS actuator and electric unit (control unit)		_	Voltage
Connector	Terminal		(Approx.)
E36	1	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 4. NO >> GO TO 3. INFOID:000000007565766

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C1109 POWER AND GROUND SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

3.CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) POWER SUPPLY CIRCUIT

- 1. Turn the ignition switch OFF.
- 2. Check the 20A fusible link (#G).
- 3. Check the continuity and short circuit between ABS actuator and electric unit (control unit) harness connector terminal (1) and 20A fusible link (#G).

Is the inspection result normal?

- YES >> Perform trouble diagnosis for battery power supply. Refer to <u>PG-11, "Wiring Diagram BATTERY</u> <u>POWER SUPPLY -"</u>.
- NO >> Repair or replace error-detected parts.

4. CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) GROUND CIRCUIT

- 1. Turn the ignition switch OFF.
- 2. Check the continuity between ABS actuator and electric unit (control unit) harness connector and ground.

ABS actuator and electric unit (control unit)			Continuity	
Connector	Terminal		Continuity	
E26	13	Ground	Existed	
L30	26			

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-102</u>, "Exploded View".

NO >> Repair or replace error-detected parts.

C1110 ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) [WITH VDC]

< DTC/CIRCUIT DIAGNOSIS >

C1110 ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

DTC Logic

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DTC	DETECTI	
	DETECT	

DTC	Display item	Malfunction detected condition	Possible cause
C1110	CONTROLLER FAILURE	When there is an internal malfunction in the ABS actuator and electric unit (control unit).	ABS actuator and electric unit (control unit)
dtc co 1. prec	NFIRMATION PROCE	DURE	
If "DTC C and wait	CONFIRMATION PROCEI at least 10 seconds befor	DURE" has been previously conducted, always e conducting the next test.	turn the ignition switch OFF
2. дтс ғ	>> GO TO 2. REPRODUCTION PROCI	EDURE	
1. Turn 2. Perfo Is DTC "(the ignition switch OFF to orm self-diagnosis for "AB <u>C1110" detected?</u>	o ON. S" with CONSULT.	uro"
NO Diagno	>> INSPECTION END sis Procedure	procedure. Refer to <u>BRC-45, Blaghosis Proced</u>	INF01D:000000007565769
1.REPL	ACE ABS ACTUATOR AN	ND ELECTRIC UNIT (CONTROL UNIT)	
Replace applicabl	ABS actuator and electric e.	: unit (control unit) when self-diagnostic result sr	nows items other than those
	> Replace ABS actuator	and electric unit (control unit). Refer to <u>BRC-10</u>	<u>2, "Exploded View"</u> .

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C1111 ABS MOTOR, MOTOR RELAY SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

C1111 ABS MOTOR, MOTOR RELAY SYSTEM

DTC Logic

INFOID:000000007565770

[WITH VDC]

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
01111		During the actuator motor operating with ON, when the actuator motor turns OFF, or when the control line for actuator motor relay is open.	 Harness or connector ABS actuator and electric unit
		During the actuator motor operating with OFF, when the actuator motor turns ON, or when the control line for relay is shorted to ground.	(control unit)

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn the ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.DTC REPRODUCTION PROCEDURE

1. Turn the ignition switch OFF to ON.

2. Perform self-diagnosis for "ABS" with CONSULT.

Is DTC "C1111" detected?

YES >> Proceed to diagnosis procedure. Refer to <u>BRC-46, "Diagnosis Procedure"</u>.

NO >> INSPECTION ĔND

Diagnosis Procedure

1.CHECK CONNECTOR

1. Turn the ignition switch OFF.

- 2. Disconnect ABS actuator and electric unit (control unit) harness connector.
- 3. Check the terminal for deformation, disconnect, looseness, etc.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected parts.

2.CHECK ABS MOTOR AND MOTOR RELAY POWER SUPPLY

1. Check the voltage between ABS actuator and electric unit (control unit) harness connector and ground.

ABS actuator and electric unit (control unit)			Voltage
Connector	Terminal		(Approx.)
E36	14	Ground	Battery voltage

2. Turn the ignition switch ON.

CAUTION:

Never start the engine.

3. Check the voltage between ABS actuator and electric unit (control unit) harness connector and ground.

ABS actuator and ele	ectric unit (control unit)		Voltage	
Connector	Terminal		(Approx.)	
E36	14	Ground	Battery voltage	

Is the inspection result normal?

YES >> GO TO 4.

INFOID:000000007565771

C1111 ABS MOTOR, MOTOR RELAY SYSTEM

[WITH VDC] < DTC/CIRCUIT DIAGNOSIS > >> GO TO 3. NO ${f 3.}$ CHECK ABS MOTOR AND MOTOR RELAY POWER SUPPLY CIRCUIT А 1. Turn the ignition switch OFF. Check the 30A fusible link (#F). 2. В Check the continuity and short circuit between ABS actuator and electric unit (control unit) harness con-3. nector terminal (14) and 30A fusible link (#F). Is the inspection result normal? С YES >> Perform trouble diagnosis for battery power supply. Refer to PG-11, "Wiring Diagram - BATTERY POWER SUPPLY -". NO >> Repair or replace error-detected parts. D 4. CHECK ABS MOTOR AND MOTOR RELAY GROUND CIRCUIT Check the continuity between ABS actuator and electric unit (control unit) harness connector and ground. Е

ABS actuator and electr	ic unit (control unit)		Continuity	
Connector	Terminal			
E36	13	Ground	Existed	
L30	26	Ground	LAISIEU	

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-102, "Exploded View"</u>.

NO >> Repair or replace error-detected parts.

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C1113, C1145, C1146 YAW RATE/SIDE/DECEL G SENSOR

< DTC/CIRCUIT DIAGNOSIS >

C1113, C1145, C1146 YAW RATE/SIDE/DECEL G SENSOR

DTC Logic

INFOID:000000007565772

[WITH VDC]

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1113	G SENSOR	Decel G sensor is malfunctioning.	
C1145	YAW RATE SENSOR	 Yaw rate sensor is malfunctioning. Yaw rate/side/decel G sensor power voltage is outside the standard. Yaw rate/side/decel G sensor signal line is open or shorted. 	 Harness or connector ABS actuator and electric unit (control unit) Yaw rate/side/decel G sensor
C1146	SIDE G-SEN CIRCUIT	Side G sensor is malfunctioning.	

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn the ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.DTC REPRODUCTION PROCEDURE

- 1. Turn the ignition switch OFF to ON.
- 2. Perform self-diagnosis for "ABS" with CONSULT.

Is DTC "C1113", "C1145" or "C1146" detected?

- YES >> Proceed to diagnosis procedure. Refer to <u>BRC-48, "Diagnosis Procedure"</u>.
- NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000007565773

CAUTION:

- Sudden turns (such as spin turns, acceleration turns), drifting, etc. may cause yaw rate/side/decel G
 sensor circuit indicate a malfunction. However this is not a malfunction if normal operation can be
 resumed after restarting engine.
- When on a turntable, such as at a parking structure entrance, or when on a moving object with engine running, the VDC warning lamp might turn ON and self-diagnosis using the CONSULT yaw rate sensor system malfunction might be displayed, but in this case there is no malfunction with yaw rate/side/decel G sensor circuit. As soon as the vehicle leaves the turntable or moving object, restart the engine to return the system to normal.

1.CHECK CONNECTOR

- 1. Turn the ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) harness connector.
- 3. Disconnect yaw rate/side/decel G sensor harness connector.
- 4. Check the terminal for deformation, disconnection, looseness, etc.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected parts.

2.CHECK YAW RATE/SIDE/DECEL G SENSOR POWER SUPPLY CIRCUIT

- 1. Connect ABS actuator and electric unit (control unit) harness connector.
- 2. Turn the ignition switch ON. CAUTION:

Never start the engine.

3. Check the voltage between yaw rate/side/decel G sensor harness connector and ground.

C1113, C1145, C1146 YAW RATE/SIDE/DECEL G SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

Yaw rate/side/de	cel G sensor		Voltage		
Connector	Terminal		(Approx.)		
M52	4	Ground	Battery voltage	_	
 Turn the ignition Check the voltage 	switch OFF. ge between yaw r	rate/side/decel	G sensor harne	- ss connector and g	jround.
Yaw rate/side/de	cel G sensor		Voltage	-	
Connector	Terminal		(Approx.)		
M52	4	Ground	0 V		
Is the inspection resi YES >> GO TO 3 NO >> Repair of 3. CHECK YAW RA	<u>ult normal?</u> 3. or replace error-de TE/SIDE/DECEL	etected parts. G SENSOR G	ROUND CIRCU	IIT	
Check the continuity	between yaw rat	e/side/decel G	sensor harness	s connector and gro	bund.
Yaw rate/side/de	cel G sensor		Continuity	-	
Connector	Terminal		Continuity	_	
M52	1	Ground	Existed		
YES >> GO TO NO >> Repair o	4. or replace error-de	etected parts.			
YES >> GO TO NO >> Repair of 4.CHECK YAW RA 1. Disconnect ABS 2. Check the conti electric unit (con	4. or replace error-de TE/SIDE/DECEL actuator and ele nuity between ya trol unit) harness	etected parts. G SENSOR H ctric unit (cont aw rate/side/de connector.	IARNESS trol unit) harness ecel G sensor h	connector. arness connector	and ABS actuator and
YES >> GO TO NO >> Repair of 4.CHECK YAW RA 1. Disconnect ABS 2. Check the conti electric unit (con ABS actuator and e	4. or replace error-de TE/SIDE/DECEL actuator and ele nuity between ya itrol unit) harness	etected parts. G SENSOR H ectric unit (cont aw rate/side/de connector.	IARNESS trol unit) harness ecel G sensor h Yaw rate/side/dee	connector. arness connector	and ABS actuator and
YES >> GO TO NO >> Repair of 4.CHECK YAW RA 1. Disconnect ABS 2. Check the conti electric unit (con ABS actuator and e Connector	4. or replace error-de TE/SIDE/DECEL actuator and ele nuity between ya itrol unit) harness lectric unit (control un Terminal	etected parts. G SENSOR H ectric unit (cont aw rate/side/de connector.	IARNESS irol unit) harness ecel G sensor h Yaw rate/side/dee Connector	connector. arness connector cel G sensor Terminal	and ABS actuator and
YES >> GO TO NO >> Repair of 4.CHECK YAW RA 1. Disconnect ABS 2. Check the conti electric unit (con ABS actuator and e Connector	4. or replace error-de TE/SIDE/DECEL actuator and ele nuity between ya itrol unit) harness lectric unit (control un Terminal 25	etected parts. G SENSOR H ectric unit (cont aw rate/side/de connector.	IARNESS trol unit) harness ecel G sensor h Yaw rate/side/dec Connector	connector. harness connector cel G sensor Terminal 2	and ABS actuator and Continuity
YES >> GO TO NO >> Repair of 4.CHECK YAW RA 1. Disconnect ABS 2. Check the conti electric unit (con ABS actuator and e Connector E36 Is the inspection rest	4. or replace error-de TE/SIDE/DECEL actuator and ele nuity between ya atrol unit) harness lectric unit (control un Terminal 25 19 ult normal?	etected parts. G SENSOR H ectric unit (cont aw rate/side/de connector.	IARNESS trol unit) harness ecel G sensor h Yaw rate/side/dec Connector M52	connector. harness connector cel G sensor Terminal 2 3	and ABS actuator and Continuity Existed

< DTC/CIRCUIT DIAGNOSIS >

C1115 WHEEL SENSOR

DTC Logic

INFOID:000000007565774

[WITH VDC]

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1115	ABS SENSOR [ABNORMAL SIGNAL]	When wheel sensor input signal is malfunctioning.	 Harness or connector Wheel sensor ABS actuator and electric unit (control unit) Sensor rotor

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn the ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

1. Start the engine and drive the vehicle at 30 km/h (19 MPH) or more for approximately 1 minute.

2. Perform self-diagnosis for "ABS" with CONSULT.

Is DTC "C1115" detected?

YES >> Proceed to diagnosis procedure. Refer to <u>BRC-50, "Diagnosis Procedure"</u>. NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000007565775

CAUTION:

Never check the between wheel sensor harness connector terminals.

1.CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) POWER SUPPLY SYSTEM

Check the ABS actuator and electric unit (control unit) power supply system. Refer to <u>BRC-81. "Diagnosis Pro-</u>cedure".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected parts.

2.CHECK TIRE

1. Turn the ignition switch OFF.

2. Check the tire air pressure, wear and size. Refer to WT-49. "Tire Air Pressure".

Is the inspection result normal?

YES >> GO TO 5.

NO >> Adjust air pressure or replace tire and GO TO 3.

3.CHECK DATA MONITOR (1)

- 1. Erase self-diagnosis result for "ABS" with CONSULT.
- 2. Turn the ignition switch OFF, and wait 10 seconds or more.
- 3. Start the engine.
- Select "ABS" and "DATA MONITOR", check the "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR" and "RR RH SENSOR" with CONSULT. NOTE:

Set the "DATA MONITOR" recording speed to "10 msec".

5. Read a value (wheel speed) of both normal wheel sensors and error-detecting wheel sensor.

Regarding the deference at 30 km/h (19 MPH) between the wheel speed detected by the error detecting wheel sensor and the maximum/minimum wheel speed detected by the normal wheel sensors, is the difference within 5%, respectively?

BRC-50

< DTC/CIRCUIT DIAGNOSIS > [WITH VDC]	_
YES >> GO TO 4. NO >> GO TO 5.	A
4.PERFORM SELF-DIAGNOSIS (1)	
 Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute. Stop the vehicle. Perform self-diagnosis for "ABS" with CONSULT. 	В
<u>Is DTC "C1115" detected?</u> YES >> GO TO 5.	С
5.check wheel sensor	
 Turn the ignition switch OFF. Check the wheel sensor for damage. Remove dust and foreign matter adhered to the sensor rotor with a vacuum dust collector through the wheel sensor mounting hole. 	, Е
 Install wheel sensor with no backlash and float, and tighten the mounting bolt to the specified torque. Front: Refer to <u>BRC-98, "FRONT WHEEL SENSOR : Exploded View"</u>. Rear: Refer to <u>BRC-99, "REAR WHEEL SENSOR : Exploded View"</u>. 	l BR
Is the inspection result normal? YES >> GO TO 8.	G
6.REPLACE WHEEL SENSOR (1)	Н
 Replace wheel sensor. Front: Refer to <u>BRC-98</u>, "FRONT WHEEL SENSOR : Exploded View". Rear: Refer to <u>BRC-99</u>, "REAR WHEEL SENSOR : Exploded View". Erase self-diagnosis result for "ABS" with CONSULT. Turn the ignition switch OFE and wait 10 seconds or more. 	
 Start the engine. Select "ABS" and "DATA MONITOR", check the "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR" and "RR RH SENSOR" with CONSULT. 	, J
Set the "DATA MONITOR" recording speed to "10 msec". 6. Read a value (wheel speed) of both normal wheel sensors and error-detecting wheel sensor.	K
Regarding the deference at 30 km/h (19 MPH) between the wheel speed detected by the error detecting wheel sensor and the maximum/minimum wheel speed detected by the normal wheel sensors, is the difference within 5%, respectively? YES >> GO TO 7	<u> </u>
NO >> GO TO 19. 7 REREORM SELE-DIAGNOSIS (2)	N
The rest of the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute. Stop the vehicle	N
 Bop the vehicle. Perform self-diagnosis for "ABS" with CONSULT. Is DTC "C1115" detected? 	
YES >> GO TO 19. NO >> INSPECTION END	0
8. CHECK CONNECTOR	Ρ
 Turn the ignition switch OFF. Check the ABS actuator and electric unit (control unit) harness connector for disconnection or looseness. Check the wheel sensor harness connector for disconnection or looseness. Is the inspection result normal? 	-
YES >> GO TO 11.	

NO >> Repair or replace error-detected parts, securely lock the harness connector, and GO TO 9.

< DTC/CIRCUIT DIAGNOSIS >

9. CHECK DATA MONITOR (2)

- 1. Erase self-diagnosis result for "ABS" with CONSULT.
- 2. Turn the ignition switch OFF, and wait 10 seconds or more.
- 3. Start the engine.
- Select "ABS" and "DATA MONITOR", check the "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR" and "RR RH SENSOR" with CONSULT.

NOTE:

- Set the "DATA MONITOR" recording speed to "10 msec".
- 5. Read a value (wheel speed) of both normal wheel sensors and error-detecting wheel sensor.

Regarding the deference at 30 km/h (19 MPH) between the wheel speed detected by the error detecting wheel sensor and the maximum/minimum wheel speed detected by the normal wheel sensors, is the difference within 5%, respectively?

YES >> GO TO 10.

NO >> GO TO 11.

10.PERFORM SELF-DIAGNOSIS (3)

- 1. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
- 2. Stop the vehicle.
- 3. Perform self-diagnosis for "ABS" with CONSULT.

Is DTC "C1115" detected?

- YES >> GO TO 11.
- NO >> INSPECTION END

11.CHECK TERMINAL

- 1. Turn the ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) harness connector and then check the ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness connector.
- 3. Disconnect wheel sensor harness connector and check the each wheel sensor pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

- YES >> GO TO 14.
- NO >> Repair or replace error-detected parts and GO TO 12.
- 12.CHECK DATA MONITOR (3)
- 1. Connect ABS actuator and electric unit (control unit) harness connector.
- 2. Connect wheel sensor harness connector.
- 3. Erase self-diagnosis result for "ABS" with CONSULT.
- 4. Turn the ignition switch OFF, and wait 10 seconds or more.
- 5. Start the engine.
- Select "ABS" and "DATA MONITOR", check the "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR" and "RR RH SENSOR" with CONSULT.
 NOTE:

Set the "DATA MONITOR" recording speed to "10 msec".

7. Read a value (wheel speed) of both normal wheel sensors and error-detecting wheel sensor.

Regarding the deference at 30 km/h (19 MPH) between the wheel speed detected by the error detecting wheel sensor and the maximum/minimum wheel speed detected by the normal wheel sensors, is the difference within 5%, respectively?

YES >> GO TO 13. NO >> GO TO 14.

13.PERFORM SELF-DIAGNOSIS (4)

- 1. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
- 2. Stop the vehicle.
- 3. Perform self-diagnosis for "ABS" with CONSULT.

Is DTC "C1115" detected?

YES >> GO TO 14.

NO >> INSPECTION END

< DTC/CIRCUIT DIAGNOSIS >

14.CHECK WHEEL SENSOR HARNESS

- 1. Turn the ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) harness connector.
- 3. Disconnect wheel sensor harness connector.

Measurement connector and terminal for power supply circuit

4. Check the continuity between ABS actuator and electric unit (control unit) harness connector and wheel sensor harness connector. (Check the continuity when steering wheel is steered to RH and LH, or center harness in wheel housing is moved.)

	1	11 3			
ABS actuator and electric unit (control unit)		Wheel	sensor	Continuity	
Connector	Terminal	Connector	Terminal	Continuity	
520	9	E22 (Front LH wheel)	1		
	5	E39 (Front RH wheel)	3	Existed	
L30	3	C5 (Rear LH wheel)	5	LXISIEU	
	11	C6 (Rear RH wheel)	7		

Measurement connector and terminal for signal circuit

ABS actuator and ele	ectric unit (control unit)	Wheel sensor		Continuity	
Connector	Terminal	Connector	Terminal	Continuity	
	8	E22 (Front LH wheel)	2		G
E 26	6	E39 (Front RH wheel)	4	Evictod	
E30	2	C5 (Rear LH wheel)	6	Existed	Н
	12	C6 (Rear RH wheel)	8		

5. Check the continuity between ABS actuator and electric unit (control unit) harness connector and the ground.

ABS actuator and ele	ectric unit (control unit)		Continuity
Connector	Terminal	—	Continuity
	9, 8	Ground	Not existed
E26	5, 6		
E30	36 Ground Ground	NOL EXISTED	
	11, 12		

Is the inspection result normal?

YES >> GO TO 15.

- NO >> Repair or replace error-detected parts and GO TO 15.
- **15.**CHECK DATA MONITOR (4)
- 1. Connect ABS actuator and electric unit (control unit) harness connector.
- 2. Connect wheel sensor harness connector.
- 3. Erase self-diagnosis result for "ABS" with CONSULT.
- 4. Turn the ignition switch OFF, and wait 10 seconds or more.
- 5. Start the engine.
- Select "ABS" and "DATA MONITOR", check the "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR" O and "RR RH SENSOR" with CONSULT.
 NOTE:
 - Set the "DATA MONITOR" recording speed to "10 msec".
- 7. Read a value (wheel speed) of both normal wheel sensors and error-detecting wheel sensor.

Regarding the deference at 30 km/h (19 MPH) between the wheel speed detected by the error detecting wheel sensor and the maximum/minimum wheel speed detected by the normal wheel sensors, is the difference within 5%, respectively?

- YES >> GO TO 16.
- NO >> GO TO 17.

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< DTC/CIRCUIT DIAGNOSIS >

16.PERFORM SELF-DIAGNOSIS (5)

- 1. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
- 2. Stop the vehicle.
- 3. Perform self-diagnosis for "ABS" with CONSULT.

Is DTC "C1115" detected?

YES >> GO TO 17.

NO >> INSPECTION END

17.REPLACE WHEEL SENSOR (2)

- 1. Replace wheel sensor.
- Front: Refer to <u>BRC-98</u>, "FRONT WHEEL SENSOR : Exploded View".
- Rear: Refer to <u>BRC-99, "REAR WHEEL SENSOR : Exploded View"</u>.
- 2. Erase self-diagnosis result for "ABS" with CONSULT.
- 3. Turn the ignition switch OFF, and wait 10 seconds or more.
- 4. Start the engine.
- 5. Select "ABS" and "DATA MONITOR", check the "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR" and "RR RH SENSOR" with CONSULT.

NOTE:

- Set the "DATA MONITOR" recording speed to "10 msec".
- 6. Read a value (wheel speed) of both normal wheel sensors and error-detecting wheel sensor.

Regarding the deference at 30 km/h (19 MPH) between the wheel speed detected by the error detecting wheel sensor and the maximum/minimum wheel speed detected by the normal wheel sensors, is the difference within 5%, respectively?

YES >> GO TO 18.

NO >> GO TO 19.

18.PERFORM SELF-DIAGNOSIS (6)

- 1. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
- 2. Stop the vehicle.
- 3. Perform self-diagnosis for "ABS" with CONSULT.
- Is DTC "C1115" detected?

YES >> GO TO 19.

NO >> INSPECTION END

19.REPLACE SENSOR ROTOR

- 1. Replace sensor rotor.
- Front: Refer to <u>BRC-101, "FRONT SENSOR ROTOR : Exploded View"</u>.
- Rear: Refer to <u>BRC-101, "REAR SENSOR ROTOR : Exploded View"</u>.
- 2. Erase self-diagnosis result for "ABS".
- 3. Turn the ignition switch OFF, and wait 10 seconds or more.
- 4. Start the engine.
- 5. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
- 6. Stop the vehicle.
- 7. Perform self-diagnosis for "ABS" with CONSULT.

Is DTC "C1115" detected?

- YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-102, "Exploded View"</u>.
- NO >> INSPECTION END

C1116 STOP LAMP SWITCH

< DTC/CIRCUIT DIAGNOSIS >

C1116 STOP LAMP SWITCH

DTC Logic

INFOID:000000007565776

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DIC	Display item	Malfunction detected condition	Possible cause
C1116	STOP LAMP SW	When a stop lamp switch signal is not input where the brake pedal is depressed.	 Harness or connector Stop lamp switch ABS actuator and electric unit (control unit)
DTC CC	NFIRMATION PROC	EDURE	
1.PREC	CONDITIONING		
If "DTC (CONFIRMATION PROC	CEDURE" has been previously conducted, always	turn the ignition switch OFF
and wait	at least 10 seconds be	fore conducting the next test.	
	>> GO TO 2.		
2. ртс і	REPRODUCTION PRO	CEDURE	
1. Turn	the ignition switch OFF		
2. Perfe	orm self-diagnosis for ". C1116" detected?	ABS" with CONSULI.	
YES	>> Proceed to diagnos	is procedure. Refer to BRC-55, "Diagnosis Proced	lure".
NO	>> INSPECTION ĔND		
Diagno	sis Procedure		INFOID:00000007565777
1. CHEC	CK CONNECTOR		
1. Turn	the ignition switch OFF		
 Disc Disc 	onnect ABS actuator a onnect stop lamp switc	nd electric unit (control unit) harness connector.	
4. Che	ck the terminal for defo	rmation, disconnection, looseness, etc.	
5. Reco secu	onnect ABS actuator irely.	and electric unit (control unit) and stop lamp	switch harness connectors
6. Start	the engine.	del corofully acyaral times, and parform calf dias	uppoint for "APP" with CON
7. Repo	T.	bal carefully several times, and perform self-diag	mosis for ABS with CON-
<u>Is the ins</u>	pection result normal?		
YES	>> GO TO 2.	connector terminal. Renair or replace error-detect	ad parts
	SK STOP I AMP SWITC		
		arance Refer to BR-7 "Inspection and Adjustment	,11
Is the ins	spection result normal?	ance. Refer to <u>DR-7, Inspection and Aujustmenn</u>	L.
YES	>> GO TO 3.		
	>> Adjust stop lamp sv	vitch clearance Refer to BR-7 "Inspection and Ad	iustment"
2			<u>luotinont</u> .

Check the stop lamp switch. Refer to BRC-56, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace stop lamp switch.

4.CHECK STOP LAMP SWITCH CIRCUIT

Connect ABS actuator and electric unit (control unit) harness connector. 1.

Check the voltage between ABS actuator and electric unit (control unit) harness connector and ground. 2.

BRC-55

2012 Murano CrossCabriolet

C1116 STOP LAMP SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

ABS actuator and ele	ectric unit (control unit)	Condition Volta		Voltage	
Connector	Terminal		Condition	(Approx.)	
E36	16	Ground	Brake pedal is depressed	Battery voltage	
	10	Clound	Brake pedal is released	0 V	

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-102, "Exploded View"</u>.

NO >> Repair or replace error-detected parts.

Component Inspection

INFOID:000000007565778

1. CHECK STOP LAMP SWITCH

- 1. Turn the ignition switch OFF.
- 2. Disconnect stop lamp switch harness connector.
- 3. Check the continuity between stop lamp switch connector terminals.

Stop lamp switch	Condition	Continuity	
Terminal	Condition	Continuity	
1 – 2	Release stop lamp switch (When brake pedal is depressed.)	Existed	
	Push stop lamp switch (When brake pedal is released.)	Not existed	

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace stop lamp switch. Refer to <u>BR-18, "Exploded View"</u>.

C1120, C1122, C1124, C1126 IN ABS SOL

< DTC/CIRCUIT DIAGNOSIS >

C1120, C1122, C1124, C1126 IN ABS SOL

DTC Logic

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause	
C1120	FR LH IN ABS SOL	When the control unit detects a malfunction in the front LH ABS IN valve circuit.		С
C1122	FR RH IN ABS SOL	When the control unit detects a malfunction in the front RH ABS IN valve circuit.	Harness or connector ABS actuator and electric unit	D
C1124	RR LH IN ABS SOL	When the control unit detects a malfunction in the rear LH ABS IN valve circuit.	(control unit)	
C1126	RR RH IN ABS SOL	When the control unit detects a malfunction in the rear RH ABS IN valve circuit.		E

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn the ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2. 2.DTC REPRODUCTION PROCEDURE	Н
 Turn the ignition switch OFF to ON. Perform self-diagnosis for "ABS" with CONSULT. Is DTC "C1120", "C1122", "C1124" or "C1126" detected? 	I
YES >> Proceed to diagnosis procedure. Refer to <u>BRC-57, "Diagnosis Procedure"</u> . NO >> INSPECTION END	J
Diagnosis Procedure	
1.CHECK CONNECTOR	K
 Turn the ignition switch OFF. Disconnect ABS actuator and electric unit (control unit) harness connector. Check the terminal for deformation, disconnection, looseness, etc. 	L
Is the inspection result normal?	
YES >> GO TO 2. NO >> Repair or replace error-detected parts. 2. CHECK ABS IN VALVE POWER SUPPLY	M

1. Check the voltage between ABS actuator and electric unit (control unit) harness connector and ground.

ABS actuator and electric unit (control unit)			Voltage
Connector	Terminal		(Approx.)
E36	1	Ground	Battery voltage

2. Turn the ignition switch ON.

CAUTION:

Never start the engine.

3. Check the voltage between ABS actuator and electric unit (control unit) harness connector and ground.

ABS actuator and ele	ectric unit (control unit)		Voltage
Connector Terminal			(Approx.)
E36	1	Ground	Battery voltage

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C1120, C1122, C1124, C1126 IN ABS SOL

< DTC/CIRCUIT DIAGNOSIS >

Is the inspection result normal?

YES >> GO TO 4.

NO >> GO TO 3.

3.CHECK ABS IN VALVE POWER SUPPLY CIRCUIT

- 1. Turn the ignition switch OFF.
- 2. Check the 20A fusible link (#G).
- 3. Check the continuity and short circuit between ABS actuator and electric unit (control unit) harness connector terminal (1) and 20A fusible link (#G).

Is the inspection result normal?

YES >> Perform trouble diagnosis for battery power supply. Refer to <u>PG-11, "Wiring Diagram - BATTERY</u> <u>POWER SUPPLY -"</u>.

NO >> Repair or replace error-detected parts.

4.CHECK ABS IN VALVE GROUND CIRCUIT

Check the continuity between ABS actuator and electric unit (control unit) harness connector and ground.

ABS actuator and electric unit (control unit)			Continuity	
Connector	Terminal		Continuity	
E36	13	Ground	Existed	
L30	26	Ground	Existed	

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-102, "Exploded View"</u>.

NO >> Repair or replace error-detected parts.

[WITH VDC]

C1121, C1123, C1125, C1127 OUT ABS SOL

< DTC/CIRCUIT DIAGNOSIS >

C1121, C1123, C1125, C1127 OUT ABS SOL

DTC Logic

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause	
C1121	FR LH OUT ABS SOL	When the control unit detects a malfunction in the front LH ABS OUT valve circuit.		С
C1123	FR RH OUT ABS SOL	When the control unit detects a malfunction in the front RH ABS OUT valve circuit.	Harness or connector ABS actuator and electric unit	D
C1125	RR LH OUT ABS SOL	When the control unit detects a malfunction in the rear LH ABS OUT valve circuit.	(control unit)	
C1127	RR RH OUT ABS SOL	When the control unit detects a malfunction in the rear RH ABS OUT valve circuit.		E

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn the ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.	
Z .DTC REPRODUCTION PROCEDURE	Н
 Turn the ignition switch OFF to ON. Perform self-diagnosis for "ABS" with CONSULT. 	-
<u>Is DTC "C1121", "C1123", "C1125" or "C1127" detected?</u>	
YES >> Proceed to diagnosis procedure. Refer to <u>BRC-59, "Diagnosis Procedure"</u> . NO >> INSPECTION END	J.
Diagnosis Procedure	2
1.CHECK CONNECTOR	K
 Turn the ignition switch OFF. Disconnect ABS actuator and electric unit (control unit) harness connector. Check the terminal for deformation, disconnection, looseness, etc. 	L
Is the inspection result normal?	
YES >> GO TO 2.	
NO >> Repair or replace error-detected parts.	M

2.CHECK ABS OUT VALVE POWER SUPPLY

1. Check the voltage between ABS actuator and electric unit (control unit) harness connector and ground.

ABS actuator and electric unit (control unit)			Voltage
Connector	Terminal		(Approx.)
E36	1	Ground	Battery voltage

2. Turn the ignition switch ON.

CAUTION:

Never start the engine.

3. Check the voltage between ABS actuator and electric unit (control unit) harness connector and ground.

ABS actuator and ele	ectric unit (control unit)		Voltage
Connector Terminal			(Approx.)
E36	1	Ground	Battery voltage

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C1121, C1123, C1125, C1127 OUT ABS SOL

< DTC/CIRCUIT DIAGNOSIS >

Is the inspection result normal?

YES >> GO TO 4.

NO >> GO TO 3.

3.CHECK ABS OUT VALVE POWER SUPPLY CIRCUIT

- 1. Turn the ignition switch OFF.
- 2. Check the 20A fusible link (#G).
- 3. Check the continuity and short circuit between ABS actuator and electric unit (control unit) harness connector terminal (1) and 20A fusible link (#G).

Is the inspection result normal?

- YES >> Perform trouble diagnosis for battery power supply. Refer to <u>PG-11, "Wiring Diagram BATTERY</u> <u>POWER SUPPLY -"</u>.
- NO >> Repair or replace error-detected parts.

4.CHECK ABS OUT GROUND CIRCUIT

Check the continuity between ABS actuator and electric unit (control unit) harness connector and ground.

ABS actuator and electric unit (control unit)			Continuity	
Connector	Terminal		Continuity	
E36	13	Ground	Existed	
L30	26	Ground	Existed	

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-102, "Exploded View"</u>.

NO >> Repair or replace error-detected parts.

[WITH VDC]

C1130 ENGINE SIGNAL

< DTC/CIRCUIT DIAGNOSIS >

C1130 ENGINE SIGNAL

DTC Logic

INFOID:000000007565783

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1130	ENGINE SIGNAL 1	Major engine components are malfunctioning.	 ECM ABS actuator and electric unit (control unit) CAN communication line
DTC CC	NFIRMATION PROCE	DURE	
1.PREC	CONDITIONING		
If "DTC C and wait	CONFIRMATION PROCED at least 10 seconds before	DURE" has been previously conducted, always e conducting the next test.	turn the ignition switch OFF
2. дтс і	>> GO TO 2. REPRODUCTION PROCE	EDURE	E
1. Turn 2. Perfe Is DTC "(the ignition switch OFF to orm self-diagnosis for "AB C1130" detected?	ON. S" with CONSULT.	
YES NO	>> Proceed to diagnosis p >> INSPECTION END	procedure. Refer to <u>BRC-61, "Diagnosis Procec</u>	l <u>ure"</u> .
Diagno	sis Procedure		INFOID:00000007565784
1.PERF	ORM SELF-DIAGNOSIS	(1)	
Perform	self-diagnosis for "ENGIN	E" with CONSULT.	
Is any ite	em indicated on the self-dia	agnosis display?	
NO	>> GO TO 2.	ing system. Refer to <u>EC-63, CONSULT Function</u>	<u>.</u> .
2.PERF	ORM SELF-DIAGNOSIS	(2)	
1. Eras	e self-diagnosis results fo	r "ABS" with CONSULT.	
 Turn Start 	the ignition switch OFF.	icle for a while.	
4. Mak	e sure that malfunction inc	licator lamp (MIL) turns OFF.	
Is indicat	tor lamp (MIL) turns OFF?		
NO	>> GO 10 3. >> Refer to <u>EC-63, "CON</u>	SULT Function".	
3.perf	ORM SELF-DIAGNOSIS	(3)	
Stop the	vehicle. Perform self-diag	nosis for "ENGINE" with CONSULT.	
<u>Is any ite</u> YES NO	em indicated on the self-dia >> Replace ABS actuator >> Repair or replace error	agnosis display? and electric unit (control unit). Refer to <u>BRC-1(</u> r-detected parts	02, "Exploded View".

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C1140 ACTUATOR RELAY SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

C1140 ACTUATOR RELAY SYSTEM

DTC Logic

INFOID:000000007565785

[WITH VDC]

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1140	ACTUATOR RLY	When the control unit detects a malfunction in the actua- tor relay system.	 Harness or connector ABS actuator and electric unit (control unit)

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn the ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.DTC REPRODUCTION PROCEDURE

1. Turn the ignition switch OFF to ON.

2. Perform self-diagnosis for "ABS" with CONSULT.

Is DTC "C1140" detected?

YES >> Proceed to diagnosis procedure. Refer to <u>BRC-62, "Diagnosis Procedure"</u>.

NO >> INSPECTION END

Diagnosis Procedure

1.CHECK CONNECTOR

1. Turn the ignition switch OFF.

- 2. Disconnect ABS actuator and electric unit (control unit) harness connector.
- 3. Check the terminal for deformation, disconnection, looseness, etc.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected parts.

2. CHECK ACTUATOR RELAY POWER SUPPLY

1. Check the voltage between ABS actuator and electric unit (control unit) harness connector and ground.

ABS actuator and ele	ectric unit (control unit)		Voltage
Connector Terminal			(Approx.)
E36	1	Ground	Battery voltage

2. Turn the ignition switch ON.

CAUTION: Never start the engine.

3. Check the voltage between ABS actuator and electric unit (control unit) harness connector and ground.

ABS actuator and ele	ectric unit (control unit)		Voltage
Connector	Terminal		(Approx.)
E36	1	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 4.

NO >> GO TO 3.

 ${f 3.}$ CHECK ACTUATOR RELAY POWER SUPPLY CIRCUIT

INFOID:000000007565786

C1140 ACTUATOR RELAY SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

- 1. Turn the ignition switch OFF.
- 2. Check the 20A fusible link (#G).
- 3. Check the continuity and short circuit between ABS actuator and electric unit (control unit) harness connector terminal (1) and 20A fusible link (#G).

Is the inspection result normal?

YES >> Perform trouble diagnosis for battery power supply. Refer to <u>PG-11, "Wiring Diagram - BATTERY</u> <u>POWER SUPPLY -"</u>.

NO >> Repair or replace error-detected parts.

4. CHECK ACTUATOR RELAY GROUND CIRCUIT

Check the continuity between ABS actuator and electric unit (control unit) harness connector and ground.

ABS actuator and electr	ic unit (control unit)		Continuity	
Connector	Terminal		Continuity	
E36	13	Ground	Evisted	
230	26	Oround	LNBIEU	

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-102, "Exploded View"</u>.

NO >> Repair or replace error-detected parts.

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< DTC/CIRCUIT DIAGNOSIS >

C1142 PRESS SENSOR

DTC Logic

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[WITH VDC]

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1142	PRESS SEN CIRCUIT	Pressure sensor signal line is open or shorted, or pres- sure sensor is malfunctioning.	 Harness or connector Stop lamp switch ABS actuator and electric unit (control unit)

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn the ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.DTC REPRODUCTION PROCEDURE

- 1. Turn the ignition switch OFF to ON.
- 2. Perform self-diagnosis for "ABS" with CONSULT.

Is DTC "C1142" detected?

- YES >> Proceed to diagnosis procedure. Refer to <u>BRC-64, "Diagnosis Procedure"</u>.
- NO >> INSPECTION END

Diagnosis Procedure

1.CHECK STOP LAMP SWITCH SYSTEM

Check the stop lamp switch system. Refer to BRC-55. "Diagnosis Procedure".

Is the inspection result normal?

- YES >> GO TO 2.
- NO >> Repair or replace error-detected parts.

2. CHECK DATA MONITOR

- 1. Check the brake fluid leakage. Refer to <u>BR-10, "Inspection"</u>.
- 2. Check the front brake piping. Refer to <u>BR-22, "FRONT : Inspection"</u>.
- 3. Check the rear brake piping. Refer to <u>BR-24, "REAR : Inspection"</u>.
- 4. Check the brake pedal. Refer to <u>BR-19, "Inspection and Adjustment"</u>.
- 5. Check the master cylinder. Refer to <u>BR-27, "Inspection"</u>.
- 6. Check the brake booster. Refer to <u>BR-29, "Inspection and Adjustment"</u>.
- 7. Check the front disc brake. Refer to <u>BR-38, "BRAKE CALIPER ASSEMBLY : Inspection"</u>.
- Check the rear disc brake. Refer to <u>BR-44</u>, "<u>BRAKE CALIPER ASSEMBLY</u> : <u>Inspection</u>".

Is the inspection result normal?

- YES >> GO TO 3.
- NO >> Repair or replace error-detected parts.

3. PERFORM SELF-DIAGNOSIS

Perform self-diagnosis for "ABS" with CONSULT.

Is any item indicated on the self-diagnosis display?

- YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-102, "Exploded View"</u>.
- NO >> Repair or replace error-detected parts.

C1143 STEERING ANGLE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

C1143 STEERING ANGLE SENSOR

DTC Logic

INFOID:000000007565789

	Display item	Malfunction detected condition	Possible cause				
C1143	ST ANG SEN CIRCUIT	Neutral position of steering angle sensor is dislocated, steering angle sensor is malfunctioning, or wheel align- ment is outside specified range.• Harness or connector • Steering angle sensor • ABS actuator and electric is (control unit) • Wheel alignment					
отс сс	ONFIRMATION PROC	EDURE					
1. PREC	CONDITIONING						
If "DTC (CONFIRMATION PROC	EDURE" has been previously conducted, always	turn the ignition switch OFF				
and wait	at least 10 seconds bet	ore conducting the next test.					
	>> GO TO 2.						
2.dtc	REPRODUCTION PRO	CEDURE					
1. Turn	the ignition switch OFF	to ON.					
2. Perf	orm self-diagnosis for "A	BS" with CONSULT.					
YES	>> Proceed to diagnosis	s procedure. Refer to <u>BR</u> C-65, "Diagnosis Proced	ure".				
NO	>> INSPECTION ĔND						
Diagnc	sis Procedure		INFOID:00000007565790				
1. CHE	CK WHEEL ALIGNMEN	г					
Check th	ne wheel alignment. Refe	er to FSU-7, "Inspection" (front), RSU-6, "Inspection"	on" (rear).				
<u>Is the ins</u>	spection result normal?		、				
YES	>> GO TO 2.	ont Pofer to ESU 7 "Inspection" (front) PSU 6 "	Adjustment" (rear)				
NO 2 снес		ent. Refer to <u>FSO-7. Inspection</u> (from), <u>RSO-6.</u>	<u>Aujustment</u> (rear).				
	the ignition switch OFF						
1 IIIrn	annaat ADC actuator an						
1. Turr 2. Disc	connect ABS actuator an	d electric unit (control unit) narness connector.					
1. Turr 2. Disc 3. Disc 4. Che	connect ABS actuator an connect steering angle se ck the terminal for defor	a electric unit (control unit) namess connector. ensor harness connector. mation, disconnection, looseness, etc.					
 Turr Disc Disc Disc Che <u>Is the ins</u> 	connect ABS actuator and connect steering angle se ck the terminal for deform spection result normal?	d electric unit (control unit) harness connector. ensor harness connector. mation, disconnection, looseness, etc.					
 Turr Disc Disc Disc Che Che Sthe ins 	onnect ABS actuator and onnect steering angle se ck the terminal for defore spection result normal? >> GO TO 3.	a electric unit (control unit) namess connector. ensor harness connector. mation, disconnection, looseness, etc.					
1. Turr 2. Disc 3. Disc 4. Che <u>Is the ins</u> YES NO 2	sonnect ABS actuator and connect steering angle se ck the terminal for defore spection result normal? >> GO TO 3. >> Repair or replace en	a electric unit (control unit) namess connector. ensor harness connector. mation, disconnection, looseness, etc.					
1. Turr 2. Disc 3. Disc 4. Che <u>Is the ins</u> YES NO 3. CHEC	connect ABS actuator and connect steering angle se ck the terminal for defore spection result normal? >> GO TO 3. >> Repair or replace error CK STEERING ANGLE S	a electric unit (control unit) namess connector. ensor harness connector. mation, disconnection, looseness, etc. ror-detected parts. SENSOR POWER SUPPLY					
1. Turr 2. Disc 3. Disc 4. Che <u>Is the ins</u> YES NO 3. CHEC 1. Che	ck the voltage between s	a electric unit (control unit) namess connector. ensor harness connector. mation, disconnection, looseness, etc. ror-detected parts. SENSOR POWER SUPPLY steering angle sensor harness connector and grou	und.				

Steering angl	e sensor		Voltage
Connector	Terminal		(Approx.)
M30	4	Ground	0 V

2. Turn the ignition switch ON. CAUTION:

Never start the engine.

3. Check the voltage between steering angle sensor harness connector and ground.

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C1143 STEERING ANGLE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

Steering angl	e sensor		Voltage
Connector	Terminal		(Approx.)
M30	4	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 5.

NO >> GO TO 4.

4.CHECK STEERING ANGLE SENSOR POWER SUPPLY CIRCUIT

- 1. Turn the ignition switch OFF.
- 2. Check the 10A fuse (#3).
- 3. Disconnect fuse block (J/B) harness connector.
- Check the continuity between steering angle sensor harness connector and fuse block (J/B) harness connector.

Steering angle sensor		Fuse block (J/B)		Continuity
Connector	Terminal	Connector	Terminal	Continuity
M30	4	M1	2A	Existed

Is the inspection result normal?

NO >> Repair or replace error-detected parts.

5.CHECK STEERING ANGLE SENSOR GROUND CIRCUIT

Check the continuity between steering angle sensor harness connector and ground.

Steering angl	e sensor		Continuity
Connector	Terminal		Continuity
M30	1	Ground	Existed

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair or replace error-detected parts.

6.CHECK STEERING WHEEL PLAY

Check the steering wheel play. Refer to ST-29, "Inspection".

Is the inspection result normal?

YES >> GO TO 7.

NO >> Repair or replace error-detected parts.

I.CHECK CAN COMMUNICATION LINE

Check the "STRG BRANCH LINE CIRCUIT". Refer to LAN-50, "Diagnosis Procedure".

Is the inspection result normal?

YES >> GO TO 8.

NO >> Repair or replace error-detected parts. Refer to LAN-22, "Precautions for Harness Repair".

8.CHECK DATA MONITOR

1. Connect the ABS actuator and electric unit (control unit) harness connector.

2. Connect the steering angle sensor harness connector.

3. Check the steering angle sensor signal. Refer to <u>BRC-19, "Reference Value"</u>.

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-102</u>, "Exploded View".

NO >> Replace steering angle sensor. Refer to <u>BRC-105</u>, "Exploded View".

YES >> Perform trouble diagnosis for ignition power supply. Refer to <u>PG-28</u>, "Wiring Diagram - IGNITION <u>POWER SUPPLY -"</u>.

C1144 INCOMPLETE STEERING ANGLE SENSOR ADJUSTMENT

< DTC/CIRCUIT DIAGNOSIS >

C1144 INCOMPLETE STEERING ANGLE SENSOR ADJUSTMENT

DTC Logic

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[WITH VDC]

DTC	Display item	Malfunction detected condition	Possible cause				
C1144	ST ANG SEN SIGNAL	Adjustment of steering angle sensor neutral position is not finished. • Harness or connector • Steering angle sensor • ABS actuator and electric un (control unit)					
DTC CC	NFIRMATION PROCE	EDURE					
1. PREC	ONDITIONING						
If "DTC (and wait	CONFIRMATION PROCE	EDURE" has been previously conducted, always ore conducting the next test	turn the ignition switch OFF				
0	>> GO TO 2.						
	REPRODUCTION PROC						
1. Turn 2. Sele	the ignition switch OFF ct "ABS", "WORK SUPF	to ON. PORT" and "ST ANGLE SENSOR ADJUSTMEN	IT" in order with CONSULT				
and	perform adjust the neutra	al position of steering angle sensor.					
Is DTC "	C1144" detected?	BS WITTCONSOLI.					
YES	>> Proceed to diagnosis	procedure. Refer to <u>BRC-67, "Diagnosis Proced</u>	<u>dure"</u> .				
NU Diagna	>> INSPECTION END						
			INFOID:00000000756579				
1. CHEC	CK STEERING ANGLE S	SENSOR					
Check th	e steering angle sensor.	Refer to <u>BRC-65, "Diagnosis Procedure"</u> .					
YES	>> Replace ABS actuate	or and electric unit (control unit). Refer to BRC-10	02, "Exploded View".				
NO	>> Repair or replace err	or-detected parts.					

C1155 BRAKE FLUID LEVEL SWITCH

< DTC/CIRCUIT DIAGNOSIS >

C1155 BRAKE FLUID LEVEL SWITCH

DTC Logic

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[WITH VDC]

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1155	BR FLUID LEVEL LOW	Brake fluid level is low or communication line between the ABS actuator and electric unit (control unit) and brake fluid level switch is open or shorted.	 Harness or connector ABS actuator and electric unit (control unit) Brake fluid level low Brake fluid level switch Combination meter

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn the ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

- Turn the ignition switch OFF to ON. 1.
- Perform self-diagnosis for "ABS" with CONSULT. 2.

Is DTC "C1155" detected?

- YES >> Proceed to diagnosis procedure. Refer to <u>BRC-68, "Diagnosis Procedure"</u>.
- NO >> INSPECTION END

Diagnosis Procedure

1. CHECK BRAKE FLUID LEVEL

- 1. Turn the ignition switch OFF.
- Check the brake fluid level. Refer to BR-10, "Inspection". 2.
- Is the inspection result normal?
- YES >> GO TO 2.
- NO >> Refill brake fluid. Refer to <u>BR-10, "Refilling"</u>.

2. PERFORM SELF-DIAGNOSIS (1)

- 1. Erase self-diagnosis result for "ABS" with CONSULT.
- Turn the ignition switch OFF, and wait 10 seconds or more. 2.
- Turn the ignition switch ON. 3. **CAUTION:**

Never start the engine.

4. Perform self-diagnosis for "ABS" with CONSULT.

Is DTC "C1155" detected?

- YES >> INSPECTION END
- NO >> GO TO 3.

3.CHECK BRAKE FLUID LEVEL SWITCH

Check the brake fluids level switch. Refer to BRC-70, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 5.

NO >> Replace sub tank. Refer to <u>BR-25, "Exploded View"</u>. GO TO 4.

4.PERFORM SELF-DIAGNOSIS (2)

1. Erase self-diagnosis result for "ABS" with CONSULT.

Turn the ignition switch OFF, and wait 10 seconds or more. 2.

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C1155 BRAKE FLUID LEVEL SWITCH

< DTC/CIRC		NOSIS >			[WITH VDC]
3. Turn the	e ignition swi	tch ON.			
Novor s)N: tart the enc	lino			
. Perform	self-diagnos	sis for "ABS"	with CONS	ULT.	
s DTC "C11	55" detected	1?			
YES >>	INSPECTIO	N END			
NO >>	GO TO 5.				
D. CHECK (CONNECTO	R AND TER	MINAL		
. Turn the	e ignition swi	tch OFF.			
2. Disconn	ect brake flu	id level swite	ch harness o	connector.	dia anna ation an la anna a
Check t	ne brake flui he brake flui	d level switc	n narness co h nin termin:	onnector for (Disconnection of looseness.
5. Disconn	ect combina	tion meter h	arness conn	ector.	
. Check t	he combinat	ion meter ha	rness conne	ector for disc	onnection or looseness.
. Check t	he combinat	ion meter pir	n terminals fo	or damage o	r loose connection with harness connector.
Disconn	ect ABS act	uator and ele	ectric unit (co	ontrol unit) h	arness connector.
nection	or looseness	iator and ele S.			amess connector namess connector for discon-
0. Check t	he ABS act	uator and el	ectric unit (d	control unit)	harness connector pin terminals for damage or
loose co	onnection wit	th harness c	onnector.	,	
s the inspec	<u>ction result n</u>	ormal?			
YES >>	GO TO 7.				
NO >>	Repair or re	place error-c	letected part	s. GO TO 6.	
D.PERFOR	M SELF-DI	AGNOSIS (3)		
. Connec	t brake fluid	level switch	harness con	nector.	
. Connec	t combinatio	n meter harr	less connec	tor.	
. Connec	t ABS actuat	tor and elect	ric unit (cont	rol unit) harn	ess connector.
Turn the	ell-ulagnosis	tch OFF and	l wait 10 sec	conds or mor	e
. Turn the	e ignition swi	tch ON.			
CAUTIC	DN:				
Never s	tart the eng	jine.			
. Perform	self-diagnos	SIS TOF "ABS"	with CONS	ULI.	
<u>SDIC "C11</u>	55" detected	<u>17</u>			
YES >>	INSPECTIO	N END			
					
.CHECK E	SRAKE FLU	ID LEVEL S			
. Turn the	e ignition swi	tch OFF.			
. Disconn	ect brake flu	ud level swite	ch harness c	connector.	arnoss connector
. Disconn	ect combina	tion meter h	arness conn	ector.	
. Check t	he continuity	/ between b	rake fluid lev	vel switch ha	arness connector and ABS actuator and electric
unit (cor	ntrol unit) ha	rness conne	ctor.		
		ABS actuato	r and electric		
Brake fluid	level switch	unit (cor	ntrol unit)	Continuity	
Connector	Terminal	Connector	Terminal		
E37	1	E36	7	Existed	

6. Check the continuity between brake fluid level switch harness connector and combination meter harness connector.

Brake fluid level switch		Combination meter		Continuity
Connector	Terminal	Connector	Terminal	Continuity
E37	1	M34	27	Existed

C1155 BRAKE FLUID LEVEL SWITCH

< DTC/CIRCUIT DIAGNOSIS >

7. Check the continuity between brake fluid level switch harness connector and ground.

Brake fluid level switch			Continuity
Connector	Terminal	—	Continuity
E37	1	Ground	Not existed

Is the inspection result normal?

YES >> GO TO 8.

NO >> Repair or replace error-detected parts.

8.CHECK BRAKE FLUID LEVEL SWITCH GROUND

Check the continuity between brake fluid level switch harness connector and ground.

Brake fluid level switch			Continuity
Connector	Terminal		Continuity
E37	2	Ground	Existed

Is the inspection result normal?

YES >> GO TO 9.

NO >> Repair or replace error-detected parts.

9.CHECK COMBINATION METER

Check the combination meter. Refer to <u>MWI-21, "CONSULT Function"</u>.

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-102, "Exploded View"</u>.

NO >> Repair or replace combination meter. Refer to <u>MWI-70, "Exploded View"</u>.

Component Inspection

INFOID:000000007565795

1.CHECK BRAKE FLUID LEVEL SWITCH

- 1. Turn the ignition switch OFF.
- 2. Disconnect brake fluid level switch harness connector.
- 3. Check the continuity between brake fluid level switch connector terminals.

Brake fluid level switch	Condition	Continuity	
Terminal	Condition	Continuity	
1_2	When brake fluid is full in the sub tank.	Not existed	
1-2	When brake fluid is empty in the sub tank.	Existed	

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace sub tank. Refer to <u>BR-25, "Exploded View"</u>.

C1160 INCOMPLETE DECEL G SENSOR CALIBRATION

< DTC/CIRCUIT DIAGNOSIS >

C1160 INCOMPLETE DECEL G SENSOR CALIBRATION

DTC Logic

INFOID:000000007565796

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[WITH VDC]

DTC DE	TECTION LOGIC			В
DTC	Display item	Malfunction detected condition	Possible cause	
C1160	DECEL G SEN SET	Calibration of decel G sensor is not finished.	 yaw rate/side/decel G sensor Harness or connector ABS actuator and electric unit (control unit) Incomplete decel G sensor calibration 	C
DTC CC	NFIRMATION PROCE	DURE		F
1.PREC	CONDITIONING			
If "DTC (and wait	CONFIRMATION PROCE at least 10 seconds befor	DURE" has been previously conducted, always e conducting the next test.	s turn the ignition switch OFF	BR
		-		
2	>> GO TO 2.			G
	REPRODUCTION PROCI			
 1. Turn 2. Sele form 3. Perf 	the ignition switch OFF to ect "ABS", "WORK SUPPC calibration of decel G ser orm self-diagnosis for "AB	DON. DRT" and "DECEL G SEN CALIBRATION" in or Insor. Refer to <u>BRC-33, "Work Procedure"</u> . S" with CONSULT.	der with CONSULT, and per-	Н
<u>Is DTC "</u>	C1160" detected?			
YES NO	>> Proceed to diagnosis >> INSPECTION END	procedure. Refer to <u>BRC-71, "Diagnosis Proce</u>	<u>dure"</u> .	
Diagno	sis Procedure		INFOID:00000007565797	J
1. CHEC	CK YAW RATE/SIDE/DEC	EL G SENSOR		
Check th	e yaw rate/side/decel G s	ensor. Refer to BRC-48, "Diagnosis Procedure	<u>"</u> .	K
Is the ins	spection result normal?			
YES NO	>> Replace ABS actuator >> Repair or replace erro	⁻ and electric unit (control unit). Refer to <u>BRC-1</u> r-detected parts.	02. "Exploded View".	L
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C1161 INCOMPLETE SIDE G SENSOR CALIBRATION

< DTC/CIRCUIT DIAGNOSIS >

C1161 INCOMPLETE SIDE G SENSOR CALIBRATION

DTC Logic

INFOID:000000007565798

INFOID:000000007565799

[WITH VDC]

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1161	SIDE G SEN SET	When there is an internal malfunction in the ABS actuator and electric unit (control unit).	ABS actuator and electric unit (control unit)

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn the ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

- 1. Turn the ignition switch OFF to ON.
- 2. Perform self-diagnosis for "ABS" with CONSULT.

Is DTC "C1161" detected?

YES >> Proceed to diagnosis procedure. Refer to <u>BRC-72, "Diagnosis Procedure"</u>.

NO >> INSPECTION END

Diagnosis Procedure

1.REPLACE ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

Replace ABS actuator and electric unit (control unit) when self-diagnostic result shows items other than those applicable.

>> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-102, "Exploded View"</u>.
C1162 INCOMPLETE PRESSURE SENSOR CALIBRATION [WITH VDC]

< DTC/CIRCUIT DIAGNOSIS >

C1162 INCOMPLETE PRESSURE SENSOR CALIBRATION

DTC Lo	ogic		INFOID:00000007565800	
DTC DE	TECTION LOGIC			В
DTC	Display item	Malfunction detected condition	Possible cause	
C1162	PRESS SEN SET	When there is an internal malfunction in the ABS actuator and electric unit (control unit).	ABS actuator and electric unit (control unit)	С
DTC CO	NFIRMATION PROCE	DURE		
1.PREC	ONDITIONING			D
If "DTC C and wait	CONFIRMATION PROCED at least 10 seconds before	DURE" has been previously conducted, always e conducting the next test.	turn the ignition switch OFF	E
	>> GO TO 2.			
2.DTC F	REPRODUCTION PROCE	EDURE		BRC
1. Turn 2. Perfo <u>Is DTC "(</u> YES	the ignition switch OFF to orm self-diagnosis for "AB <u>C1162" detected?</u> >> Proceed to diagnosis p	ON. S" with CONSULT. procedure. Refer to BRC-73, "Diagnosis Proced	ure".	G
NO	>> INSPECTION END			Н
Diagno	sis Procedure		INFOID:00000007565801	
1.REPL	ACE ABS ACTUATOR AN	ND ELECTRIC UNIT (CONTROL UNIT)		
Replace	ABS actuator and electric	unit (control unit) when self-diagnostic result sh	nows items other than those	
applicabl	е.			J
	>> Replace ABS actuator	and electric unit (control unit). Refer to BRC-10	2. "Exploded View".	
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< DTC/CIRCUIT DIAGNOSIS >

C1164, C1165 CV SYSTEM

DTC Logic

INFOID:000000007565802

INFOID:00000007565803

[WITH VDC]

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1164	CV1	Cut valve 1 (CV1) on the primary side is open circuit or shorted, or the control line is open or shorted to the power supply or the ground.	Harness or connector ABS actuator and electric unit
C1165	CV2	Cut valve 2 (CV2) on the secondary side is open circuit or shorted, or the control line is open or shorted to the power supply or the ground.	(control unit)

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn the ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.DTC REPRODUCTION PROCEDURE

- 1. Turn the ignition switch OFF to ON.
- 2. Perform self-diagnosis for "ABS" with CONSULT.

Is DTC "C1164" or "C1165" detected?

YES >> Proceed to diagnosis procedure. Refer to <u>BRC-74, "Diagnosis Procedure"</u>.

NO >> INSPECTION END

Diagnosis Procedure

1.CHECK CONNECTOR

- 1. Turn the ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) harness connector.
- 3. Check the terminal for deformation, disconnection, looseness, etc.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected parts.

2. CHECK CUT VALVE (CV) POWER SUPPLY

1. Check the voltage between ABS actuator and electric unit (control unit) harness connector and ground.

ABS actuator and ele	ectric unit (control unit)	_	Voltage (Approx.)
Connector	Terminal		
E36	1	Ground	Battery voltage

2. Turn the ignition switch ON.

CAUTION:

Never start the engine.

3. Check the voltage between ABS actuator and electric unit (control unit) harness connector and ground.

ABS actuator and ele	ectric unit (control unit)	_	Voltage
Connector	Connector Terminal		(Approx.)
E36	1	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 4.

C1164, C1165 CV SYSTEM

< DTC/CIRCUIT DI/	AGNOSIS >			[WITH VDC]	
NO >> GO TO 3	3.				
3.CHECK CUT VAL	VE (CV) POWEI	R SUPPLY CIR	CUIT		А
 Turn the ignition Check the 20A f Check the contin nector terminal (switch OFF. usible link (#G). nuity and short c 1) and 20A fusib	ircuit between <i>I</i> le link (#G).	ABS actuator an	d electric unit (control unit) harness con-	В
Is the inspection results YES >> Perform POWER	<u>ult normal?</u> trouble diagnosi <u>SUPPLY -"</u> .	s for battery po	wer supply. Refe	er to <u>PG-11. "Wiring Diagram - BATTERY</u>	С
NO >> Repair o 4.CHECK CUT VAL	r replace error-d .VE (CV) GROUI	etected parts. ND CIRCUIT			D
Check the continuity	between ABS ac	ctuator and elec	ctric unit (control	unit) harness connector and ground.	E
ABS actuator and electr	ic unit (control unit)		Continuity	-	
Connector	Terminal	_	Continuity		

Existed

Is the inspection result normal?

E36

>> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-102</u>, "<u>Exploded View</u>". >> Repair or replace error-detected parts. YES

Ground

NO

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< DTC/CIRCUIT DIAGNOSIS >

C1166, C1167 SV SYSTEM

DTC Logic

INFOID:000000007565804

INFOID:00000007565805

[WITH VDC]

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1166	SV1	Suction valve 1 (SV1) on the primary side is open circuit or shorted, or the control line is open or shorted to the power supply or the ground.	Harness or connector ABS actuator and electric unit
C1167	SV2	Suction valve 2 (SV2) on the secondary side is open cir- cuit or shorted, or the control line is open or shorted to the power supply or the ground.	(control unit)

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn the ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.DTC REPRODUCTION PROCEDURE

- 1. Turn the ignition switch OFF to ON.
- 2. Perform self-diagnosis for "ABS" with CONSULT.

Is DTC "C1166" or "C1167" detected?

YES >> Proceed to diagnosis procedure. Refer to <u>BRC-76, "Diagnosis Procedure"</u>.

NO >> INSPECTION END

Diagnosis Procedure

1.CHECK CONNECTOR

- 1. Turn the ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) harness connector.
- 3. Check the terminal for deformation, disconnection, looseness, etc.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected parts.

2. CHECK SUCTION VALVE (SV) POWER SUPPLY

1. Check the voltage between ABS actuator and electric unit (control unit) harness connector and ground.

ABS actuator and ele	ectric unit (control unit)	_	Voltage (Approx.)
Connector	Terminal		
E36	1	Ground	Battery voltage

2. Turn the ignition switch ON.

CAUTION:

Never start the engine.

3. Check the voltage between ABS actuator and electric unit (control unit) harness connector and ground.

ABS actuator and ele	ectric unit (control unit)	_	Voltage
Connector	Connector Terminal		(Approx.)
E36	1	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 4.

C1166, C1167 SV SYSTEM

< DTC/CIRCUIT DIAGNOSIS > [WITH VDC]	
NO >> GO TO 3.	
3. CHECK SUCTION VALVE (SV) POWER SUPPLY CIRCUIT	А
 Turn the ignition switch OFF. Check the 20A fusible link (#G). Check the continuity and short circuit between ABS actuator and electric unit (control unit) harness connector terminal (1) and 20A fusible link (#G). 	В
Is the inspection result normal? YES >> Perform trouble diagnosis for battery power supply. Refer to <u>PG-11, "Wiring Diagram - BATTERY</u> <u>POWER SUPPLY -"</u> .	С
NO >> Repair or replace error-detected parts. 4. CHECK SUCTION VALVE (SV) GROUND CIRCUIT	D
Check the continuity between ABS actuator and electric unit (control unit) harness connector and ground.	E

			Continuity
Connector	Terminal		Continuity
F36	13	Ground	Existed
L30	26	Oround	LXISted

Is the inspection result normal?

>> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-102</u>, "<u>Exploded View</u>". >> Repair or replace error-detected parts. YES

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U1000 CAN COMM CIRCUIT

Description

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN-H line, CAN-L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.

DTC Logic

INFOID:000000007565807

INFOID:000000007565808

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
U1000	CAN COMM CIRCUIT	When ABS actuator and electric unit (control unit) is not transmitting or receiving CAN communication signal for 2 seconds or more.	 Harness or connector CAN communication line ABS actuator and electric unit (control unit)

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn the ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.DTC REPRODUCTION PROCEDURE

- 1. Turn the ignition switch OFF to ON.
- 2. Perform self-diagnosis for "ABS" with CONSULT.

Is DTC "U1000" detected?

- YES >> Proceed to diagnosis procedure. Refer to <u>BRC-78, "Diagnosis Procedure"</u>.
- NO >> INSPECTION END

Diagnosis Procedure

1.PERFORM SELF-DIAGNOSIS

Perform self-diagnosis for "ABS" with CONSULT.

Is DTC "U1000" detected?

- YES >> Proceed to LAN-15, "Trouble Diagnosis Flow Chart".
- NO >> INSPECTION END

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< DTC/CIRCUIT DIAGNOSIS >

U1002 SYSTEM COMM (CAN)

Description

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN-H line, CAN-L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.

DTC Logic

INFOID:000000007565810

DTC DETECTION LOGIC

U1002 SYSTEM COMM (CAN) When ABS actuator and electric unit (control unit) is not transmitting or receiving CAN communication signal of steering angle sensor for 2 seconds or less. • Harness or connector • CAN communication line. • ABS actuator and electric unit (control unit) is not it transmitting or receiving CAN communication signal of steering angle sensor for 2 seconds or less. • ABS actuator and electric unit (control unit) is not it transmitting or receiving CAN communication signal of steering angle sensor for 2 seconds or less. • ABS actuator and electric unit (control unit) is not it transmitting or receiving CAN communication signal of transmitting or receiving CAN communication switch OFF DTC CONFIRMATION PROCEDURE I 1. Turn the ignition switch OFF to ON. I 2. DTC CU1002" detected? I YES > Proceed to diagnosis procedure. Refer to BRC-79. "Diagnosis Procedure". NO >> INSPECTION END Diagnosis Procedure I • Never apply 7.0 V or more to the measurement terminal. Use a tester with open terminal voltage of 7.0 V or less. • Turn the ign	DTC	Display item	Malfunction detected condition	Possible cause
DTC CONFIRMATION PROCEDURE G 1.PRECONDITIONING G If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn the ignition switch OFF and wait at least 10 seconds before conducting the next test. H >> GO TO 2. 2.DTC REPRODUCTION PROCEDURE I 1. Turn the ignition switch OFF to ON. 2.Perform self-diagnosis for "ABS" with CONSULT. J Is DTC "U1002" detected? J YES >> Proceed to diagnosis procedure. Refer to BRC-79. "Diagnosis Procedure". K NO >> INSPECTION END K Diagnosis Procedure Nor >> INSPECTION END K O as tester with open terminal voltage of 7.0 V or less. M I.CHECK CAN DIAGNOSIS SUPPORT MONITOR M 1. Select "ABS" and "CAN Diagnosis Support Monitor" in order with CONSULT. N 2. Check the maifunction history between each control unit connected to ABS actuator and electric unit (control unit). N Check the result of "PAST" A All items are "OK">Acontrol unit done than ABS actuator and electric unit (control unit) is anything other than "OK">GO TO 2.	U1002	SYSTEM COMM (CAN)	When ABS actuator and electric unit (control unit) is not transmitting or receiving CAN communication signal of steering angle sensor for 2 seconds or less.	 Harness or connector CAN communication line ABS actuator and electric unit (control unit)
1.PRECONDITIONING Image: Second S	DTC CC	NFIRMATION PROCE	DURE	
If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn the ignition switch OFF and wait at least 10 seconds before conducting the next test. H >> GO TO 2. 2.DTC REPRODUCTION PROCEDURE I 1. Turn the ignition switch OFF to ON. 2. Perform self-diagnosis for "ABS" with CONSULT. J Is DTC "U1002" detected? J YES >> Proceed to diagnosis procedure. Refer to BRC-79. "Diagnosis Procedure". K NO >> INSPECTION END K Diagnosis Procedure ************************************	1.PREC	CONDITIONING		
 >> GO TO 2. 2. DTC REPRODUCTION PROCEDURE 1. Turn the ignition switch OFF to ON. 2. Perform self-diagnosis for "ABS" with CONSULT. Is DTC "U1002" detected? YES >> Proceed to diagnosis procedure. Refer to <u>BRC-79</u>, "Diagnosis Procedure". NO >> INSPECTION END Diagnosis Procedure Network apply 7.0 V or more to the measurement terminal. Use a tester with open terminal voltage of 7.0 V or less. 1. CHECK CAN DIAGNOSIS SUPPORT MONITOR 1. Select "ABS" and "CAN Diagnosis Support Monitor" in order with CONSULT. 2. Check the malfunction history between each control unit connected to ABS actuator and electric unit (control unit). Check the result of "PAST" All items are "OK">> GO TO 2. A control unit other than ABS actuator and electric unit (control unit) is anything other than "OK">> GO TO 3. 	If "DTC C and wait	CONFIRMATION PROCEI at least 10 seconds befor	DURE" has been previously conducted, always e conducting the next test.	turn the ignition switch OFF
2.DTC REPRODUCTION PROCEDURE I 1. Turn the ignition switch OFF to ON. 2. Perform self-diagnosis for "ABS" with CONSULT. Is DTC "U1002" detected? J YES >> Proceed to diagnosis procedure. Refer to BRC-79, "Diagnosis Procedure". NO >> INSPECTION END Diagnosis Procedure wFORCOMMENT CAUTION: • • Never apply 7.0 V or more to the measurement terminal. • • Use a tester with open terminal voltage of 7.0 V or less. • • Turn the ignition switch OFF and disconnect the battery cable from the negative terminal when checking the harness. M 1. CHECK CAN DIAGNOSIS SUPPORT MONITOR N 1. Select "ABS" and "CAN Diagnosis Support Monitor" in order with CONSULT. N Check the malfunction history between each control unit connected to ABS actuator and electric unit (control unit). N Check the result of "PAST" O All items are "OK">"TRANSMIT DIAG" is other than "OK">>GO TO 2. A control unit other than ABS actuator and electric unit (control unit) is anything other than "OK">>GO TO 3.		>> GO TO 2.		
 Turn the ignition switch OFF to ON. Perform self-diagnosis for "ABS" with CONSULT. Is DTC "U1002" detected? YES >> Proceed to diagnosis procedure. Refer to BRC-79, "Diagnosis Procedure". NO >> INSPECTION END INSPECTION END Is Proceed to the measurement terminal. Use a tester with open terminal voltage of 7.0 V or less. Turn the ignition switch OFF and disconnect the battery cable from the negative terminal when checking the harness. 1. CHECK CAN DIAGNOSIS SUPPORT MONITOR Select "ABS" and "CAN Diagnosis Support Monitor" in order with CONSULT. Check the malfunction history between each control unit connected to ABS actuator and electric unit (control unit). Check the result of "PAST" All items are "OK">OK">>Refer to GI-40, "Intermittent Incident". "TRANSMIT DIAG" is other than "OK">>GO TO 2. A control unit other than ABS actuator and electric unit (control unit) is anything other than "OK">>GO TO 3.	2.DTC	REPRODUCTION PROCE	EDURE	
YES >> Proceed to diagnosis procedure. Refer to BRC-79, "Diagnosis Procedure". K NO >> INSPECTION END K Diagnosis Procedure MEDIAGROSIS Procedure L CAUTION: Image: Second	1. Turn 2. Perfe Is DTC "I	the ignition switch OFF to orm self-diagnosis for "AB U1002" detected?	ON. S" with CONSULT.	
Diagnosis Procedure NECLECONCONCONCONCONCONCONCONCONCONCONCONCONC	YES NO	>> Proceed to diagnosis p >> INSPECTION END	procedure. Refer to <u>BRC-79, "Diagnosis Proced</u>	ure".
 CAUTION: Never apply 7.0 V or more to the measurement terminal. Use a tester with open terminal voltage of 7.0 V or less. Turn the ignition switch OFF and disconnect the battery cable from the negative terminal when checking the harness. 1. CHECK CAN DIAGNOSIS SUPPORT MONITOR Select "ABS" and "CAN Diagnosis Support Monitor" in order with CONSULT. Check the malfunction history between each control unit connected to ABS actuator and electric unit (control unit). Check the result of "PAST" All items are "OK">>Refer to GI-40. "Intermittent Incident". "TRANSMIT DIAG" is other than "OK">>GO TO 2. A control unit other than ABS actuator and electric unit (control unit) is anything other than "OK">>GO TO 3. 	Diagno	sis Procedure		INFOID:00000007565811
 CHECK CAN DIAGNOSIS SUPPORT MONITOR Select "ABS" and "CAN Diagnosis Support Monitor" in order with CONSULT. Check the malfunction history between each control unit connected to ABS actuator and electric unit (control unit). <u>Check the result of "PAST"</u> All items are "OK">>Refer to <u>GI-40. "Intermittent Incident"</u>. "TRANSMIT DIAG" is other than "OK">>GO TO 2. A control unit other than ABS actuator and electric unit (control unit) is anything other than "OK">>GO TO 3. 	CAUTIO Never Use a t Turn t checki 	N: apply 7.0 V or more to th tester with open termina he ignition switch OFF ing the harness.	ne measurement terminal. I voltage of 7.0 V or less. and disconnect the battery cable from the	e negative terminal when
 Select "ABS" and "CAN Diagnosis Support Monitor" in order with CONSULT. Check the malfunction history between each control unit connected to ABS actuator and electric unit (control unit). <u>Check the result of "PAST"</u> All items are "OK">>Refer to <u>GI-40. "Intermittent Incident"</u>. "TRANSMIT DIAG" is other than "OK">>GO TO 2. A control unit other than ABS actuator and electric unit (control unit) is anything other than "OK">>GO TO 3. 	1. CHEC	CK CAN DIAGNOSIS SUF	PORT MONITOR	
<u>Check the result of "PAST"</u> All items are "OK">>Refer to <u>GI-40. "Intermittent Incident"</u> . "TRANSMIT DIAG" is other than "OK">>GO TO 2. A control unit other than ABS actuator and electric unit (control unit) is anything other than "OK">>GO TO 3.	1. Sele 2. Cheo trol u	ct "ABS" and "CAN Diagn ck the malfunction history unit).	osis Support Monitor" in order with CONSULT. between each control unit connected to ABS ac	tuator and electric unit (con-
All items are "OK">>Refer to <u>GI-40. "Intermittent Incident"</u> . "TRANSMIT DIAG" is other than "OK">>GO TO 2. A control unit other than ABS actuator and electric unit (control unit) is anything other than "OK">>GO TO 3.	Check th	e result of "PAST"		
······································	All item "TRANS A contro	s are "OK">>Refer to <u>GI-4</u> SMIT DIAG" is other than ' ol unit other than ABS actu	<u>0, "Intermittent Incident"</u> . 'OK">>GO TO 2. Jator and electric unit (control unit) is anything c	other than "OK">>GO TO 3.
2. CHECK TRANSMITTING SIDE UNIT	2.снес	CK TRANSMITTING SIDE	UNIT	
Check the ABS actuator and electric unit (control unit) harness connector terminals No. 21 and 23 for damage or loose connection.	Check th or loose	e ABS actuator and electr connection.	ic unit (control unit) harness connector terminal	s No. 21 and 23 for damage
Is the inspection result normal? YES Frase self-diagnosis results. Then perform self-diagnosis for "ABS" with CONSULT	Is the ins	spection result normal?	esults Then perform self-diagnosis for "ARS" wi	th CONSULT

BRC-79

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U1002 SYSTEM COMM (CAN)

< DTC/CIRCUIT DIAGNOSIS >

NO >> Recheck the terminals for damage or loose connection. Refer to <u>LAN-5</u>, "Precautions for Harness <u>Repair</u>".

3. CHECK APPLICABLE CONTROL UNIT

Check the damage or loose connection of each CAN communication line harness connector terminals.

Is the inspection result normal?

- YES >> Erase self-diagnosis results. Then perform self-diagnosis for applicable control unit with CON-SULT.
- NO >> Recheck the terminals for damage or loose connection. Refer to <u>LAN-5</u>, "Precautions for Harness <u>Repair"</u>.

POWER SUPPLY AND GROUND CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

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POWER SUPPLY AND GROUND CIRCUIT

Diagnosis Procedure

1. CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) IGNITION POWER SUPPLY

- 1. Turn the ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) harness connector.
- 3. Check the voltage between ABS actuator and electric unit (control unit) harness connector and ground.

ABS actuator and electric unit (control unit)		_	Voltage	
Connector	Terminal		(Approx.)	
E36	20	Ground	0 V	

 Turn the ignition switch ON. CAUTION:

Never start the engine.

5. Check the voltage between ABS actuator and electric unit (control unit) harness connector and ground.

ABS actuator a (contr	and electric unit ol unit)	_	Voltage
Connector	Terminal		(Approx.)
E36	20	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 3.

NO >> GO TO 2.

2.CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) IGNITION POWER SUPPLY CIRCUIT

1. Turn the ignition switch OFF.

2. Check the 10A fuse (#45).

- 3. Disconnect IPDM E/R harness connector.
- Check the continuity between ABS actuator and electric unit (control unit) harness connector and IPDM E/ R harness connector.

ABS actuator and electric unit (control unit)		IPDI	M E/R	Continuity
Connector	Terminal	Connector	Terminal	
E36	20	E10	25	Existed

Is the inspection result normal?

YES >> Perform trouble diagnosis for ignition power supply. Refer to <u>PG-28, "Wiring Diagram - IGNITION</u> <u>POWER SUPPLY -"</u>.

NO >> Repair or replace error-detected parts.

${f 3.}$ CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) BATTERY POWER SUPPLY

- 1. Turn the ignition switch OFF.
- 2. Check the voltage between ABS actuator and electric unit (control unit) harness connector and ground.

ABS actuator and electric unit (control unit) Connector Terminal		_	Voltage
			(Approx.)
E36	1	Ground	Battery voltage
230	14	Crodina	Dattery voltage

 Turn the ignition switch ON. CAUTION:

POWER SUPPLY AND GROUND CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

Never start the engine.

4. Check the voltage between ABS actuator and electric unit (control unit) harness connector and ground.

ABS actuator a (contro	and electric unit ol unit)		Voltage	
Connector	Terminal		(Αρριοκ.)	
E36	1	Ground	Battery voltage	
230	14	Orodild	Dattery voltage	
Is the inspection	on result norm	al?		
YES >> G	O TO 5.			
NO >> G	O TO 4.			
4.CHECK AE	BS ACTUATOR	R AND ELECT	RIC UNIT (CONTR	OL UNIT) BATTERY POWER SUPPLY CIRCUIT
1. Turn the iq	gnition switch	OFF.		
2. Check the	e 20A fusible li	nk (#G) and 30	DA fusible link (#F).	
3. Check the	e continuity an	d short circuit	between ABS actu	ator and electric unit (control unit) harness con-
A Check the	r_{1} continuity and	d short circuit	(#G). hetween ΔBS actu	ator and electric unit (control unit) barness con-
nector ter	minal (14) and	30A fusible li	nk (#F).	
Is the inspection	on result norm	al?		
YES >> Po Po	erform trouble	diagnosis for <u>Y -"</u> .	battery power supp	ly. Refer to PG-11, "Wiring Diagram - BATTERY
NO >> R	epair or replac	e error-detect	ed parts.	
5.CHECK AE	BS ACTUATO	R AND ELECT	RIC UNIT (CONTR	OL UNIT) GROUND CIRCUIT

- 1. Turn the ignition switch OFF.
- 2. Check the continuity between ABS actuator and electric unit (control unit) harness connector and ground.

ABS actuator a (contr	and electric unit ol unit)	_	Continuity	
Connector Terminal				
Eac	13	Ground	Existed	
E30	26	Ground	Existed	

Is the inspection result normal?

- YES >> INSPECTION END
- NO >> Repair or replace error-detected parts.

< DTC/CIRCUIT DIAGNOSIS	>			[WITH VDC]
PARKING BRAKE SW	/ITCH			
Component Function Ch	eck			INFOID:00000007565813
1.CHECK PARKING BRAKE S	WITCH O	PERATION		
Operate the parking brake peda OFF correctly.	l. Then ch	eck that the t	orake warning	lamp in the combination meter turns ON/
Condition	Brake	warning lamp ill	umination status	•
When the parking brake pedal is operative	ation	ON		
When the parking brake pedal is not c ation.	per-	OFF		
Is the inspection result normal? YES >> INSPECTION END NO >> Proceed to diagnos	is procedu	ıre. Refer to <u>I</u>	3RC-83, "Diag	nosis Procedure".
Diagnosis Procedure				INF01D:00000007565814
1.CHECK PARKING BRAKE S	WITCH			_
Check the parking brake switch Is the inspection result normal?	. Refer to I	<u>3RC-83, "Co</u> i	mponent Insp	ection".
NO >> Replace parking bra NO >> Replace parking bra CHECK COMBINATION ME	ake switch TER	. Refer to <u>PB</u>	<u>-6, "Exploded</u>	<u>View"</u> .
Check the indication and opera Function".	tion of cor	nbination me	ter are norma	I. Refer to <u>MWI-20, "On Board Diagnosis</u>
s the inspection result normal? YES >> GO TO 3. NO >> Check the combina	tion meter	. Refer to <u>MV</u>	/I-21, "CONSI	<u>JLT Function"</u> .
J. CHECK PARKING BRAKE S	WITCH C	IRCUIT		
 Turn the ignition switch OFI Disconnect parking brake s Disconnect combination me Check the continuity betwee connector. 	 witch harn eter harnes een parkin	ess connecto ss connector. g brake swite	or. ch harness co	nnector and combination meter harness
Parking brake switch	Combinat	ion meter	0	
Connector Terminal C	onnector	Terminal	Continuity	
E27 1	M34	26	Existed	
Is the inspection result normal?YES>> INSPECTION ENDNO>> Repair or replace e	rror-detect	ed parts.		
Component Inspection				INFOID:000000007565815
1.CHECK PARKING BRAKE S	WITCH			
1. Turn the ignition switch OFI	Ξ.,			

PARKING BRAKE SWITCH

Disconnect parking brake switch harness connector.
 Check the continuity between parking brake switch connector terminal and ground.

PARKING BRAKE SWITCH

< DTC/CIRCUIT DIAGNOSIS >

Parking brake switch			Condition	Continuity
Connector	Terminal		Condition	Continuity
F27	-07 4	Ground	When the parking brake switch is operated.	Existed
	Ι	Cround	When the parking brake switch is not operated.	Not existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace parking brake switch. Refer to <u>PB-6. "Exploded View"</u>.

< DTC/CIRCUIT DIAGN	NOSIS >			[WITH VDC]	
VDC OFF SWITC	СН				Δ
Component Function	on Check			INF0ID:00000007565816	A
1.CHECK VDC OFF S	WITCH OPERA	ΓΙΟΝ			В
Turn ON/OFF the VDC C ON/OFF correctly.	OFF switch and	check that the	VDC OFF ind	icator lamp in the combination meter turns	
Is the inspection result n YES >> INSPECTIO NO >> Proceed to c	ormal? N END diagnosis proce	dure. Refer to	BRC-85. "Dia	anosis Procedure".	С
Diagnosis Procedu	re			INFOID:00000007565817	C
1.CHECK VDC OFF SV	WITCH				-
Check the VDC OFF sw	itch. Refer to BF	RC-86, "Comp	onent Inspecti	on".	
Is the inspection result n	ormal?				БГ
NO >> Replace VD	C OFF switch.				Dr
2.CHECK VDC OFF S	WITCH HARNE	SS			
1. Disconnect ABS act	uator and electr	ic unit (control	l unit) harness	connector.	G
 Disconnect VDC OF Check the continuity (control unit) harnes 	y between VDC s connector.	SS connector. COFF switch	harness conn	ector and ABS actuator and electric unit	ŀ
ABS actuator and electric u (control unit)	nit VDC C	OFF switch	Continuity	-	I
Connector Terminal	Connector	Terminal	Existe d	-	
4. Check the continuity	v between ABS a	actuator and e	electric unit (co		J
			,	-	
ABS actuator and electric un	Terminal	- Continuity			k
E36	22	Ground	Not existed	-	
5. Check the continuity	v between VDC	OFF switch ha	arness connec	tor and ground.	L
	b			-	
Connector	Terminal	—	Continuity		N
M5	2	Ground	Existed	-	
Is the inspection result n	ormal?			-	Ν
YES >> GO TO 3.	nlace error-dete	cted narts			
3.CHECK COMBINATIO	ON METER	ucu paris.			C
1. Connect ABS actual	tor and electric	unit (control ur	nit) harness co	nnector.	
 Connect VDC OFF s Check the indication nosis Function". 	switch harness of and operation	connector. of combinatio	n meter are no	ormal. Refer to <u>MWI-20, "On Board Diag-</u>	F

Is the inspection result normal?

- YES >> INSPECTION END
- NO >> Repair or replace combination meter.

VDC OFF SWITCH

< DTC/CIRCUIT DIAGNOSIS >

Component Inspection

INFOID:000000007565818

[WITH VDC]

1.CHECK VDC OFF SWITCH

- 1. Turn the ignition switch OFF.
- 2. Disconnect VDC OFF switch harness connector.

3. Check the continuity between VDC OFF switch connector terminals.

VDC OFF switch	Condition	Condition	
Terminal	Condition	Condition	
1_2	When VDC OFF switch is hold pressed.	Existed	
1 – 2	When releasing VDC OFF switch.	Not existed	

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace VDC OFF switch.

ABS WARNING LAMP

< DTC/CIRCUIT DIAGNOSIS >	[WITH VDC]
ABS WARNING LAMP	
Component Function Check	INFOID:000000007565819
1. CHECK ABS WARNING LAMP OPERATION	
Check that the lamp illuminates for approximately 2 seconds after the ignition switch is turned Is the inspection result normal? YES >> INSPECTION END NO >> Proceed to diagnosis procedure. Refer to <u>BRC-87, "Diagnosis Procedure"</u> .	ed ON.
Diagnosis Procedure	INFOID:000000007565820
1.PERFORM SELF-DIAGNOSIS	
Perform self-diagnosis for "ABS" with CONSULT.	
Is the inspection result normal?	
NO >> Check items displayed by self-diagnosis for "ABS" with CONSULT.	

BRAKE WARNING LAMP

Component Function Check

1.BRAKE WARNING LAMP OPERATION CHECK 1

Check that the lamp illuminates for approximately 2 seconds after the ignition switch is turned ON.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Proceed to diagnosis procedure. Refer to <u>BRC-88, "Diagnosis Procedure"</u>.

2.BRAKE WARNING LAMP OPERATION CHECK 2

Check that the brake warning lamp in the combination meter turns ON/OFF correctly when operating the parking brake pedal.

NŎTE:

Brake warning lamp will turn ON in case of parking brake operation (when switch is ON) or of brake fluid level switch operation (when brake fluid is insufficient).

Is the inspection result normal?

YES >> INSPECTION END

NO >> Check the parking brake switch. Refer to <u>BRC-83, "Diagnosis Procedure"</u>.

Diagnosis Procedure

INFOID:000000007565822

1.CHECK PARKING BRAKE SWITCH

Check that the brake warning lamp in the combination meter turns ON/OFF correctly when operating the parking brake pedal.

NŎTE:

Brake warning lamp will turn ON in case of parking brake operation (when switch is ON) or of brake fluid level switch operation (when brake fluid is insufficient).

Is the inspection result normal?

YES >> GO TO 2.

NO >> Check the parking brake switch. Refer to <u>BRC-83. "Diagnosis Procedure"</u>.

2. PERFORM SELF-DIAGNOSIS

Perform self-diagnosis for "ABS" with CONSULT.

Is the inspection result normal?

- YES >> Check the combination meter. Refer to <u>MWI-21, "CONSULT Function"</u>.
- NO >> Check items displayed by self-diagnosis for "ABS" with CONSULT.

INFOID:000000007565821

VDC WARNING LAMP

< DTC/CIRCUIT DIAGNOSIS >	[WITH VDC]
VDC WARNING LAMP	
Component Function Check	INFOID:000000007565825
1.CHECK VDC WARNING LAMP OPERATION	
Check that the lamp illuminates for approximately 2 seconds after the ignition switch is turned Is the inspection result normal? YES >> INSPECTION END NO >> Proceed to diagnosis procedure. Refer to <u>BRC-89, "Diagnosis Procedure"</u> .	ed ON.
Diagnosis Procedure	INFOID:000000007565826
1.PERFORM SELF-DIAGNOSIS	
Perform self-diagnosis for "ABS" with CONSULT. <u>Is the inspection result normal?</u>	
YES >> Check the combination meter. Refer to <u>MWI-21, "CONSULT Function"</u> . NO >> Check items displayed by self-diagnosis for "ABS" with CONSULT.	

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VDC OFF INDICATOR LAMP

Component Function Check

1.VDC OFF INDICATOR LAMP OPERATION CHECK 1

Check that the lamp illuminates for approximately 2 seconds after the ignition switch is turned ON.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Proceed to diagnosis procedure. Refer to <u>BRC-90, "Diagnosis Procedure"</u>.

2.VDC OFF INDICATOR LAMP OPERATION CHECK 2

Check that the VDC OFF indicator lamp in the combination meter turns ON/OFF correctly when operating the VDC OFF switch.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Check the VDC OFF switch. Refer to <u>BRC-85, "Diagnosis Procedure"</u>.

Diagnosis Procedure

INFOID:000000007565824

1 .check abs actuator and electric unit (control unit) power supply and ground circuit

Perform diagnosis of ABS actuator and electric unit (control unit) power supply and ground circuit. Refer to <u>BRC-81, "Diagnosis Procedure"</u>.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected parts.

2.CHECK VDC OFF INDICATOR LAMP SIGNAL (1)

1. Select "ABS", "DATA MONITOR" and "OFF LAMP" according to this order with CONSULT.

- 2. Turn the ignition switch OFF.
- 3. Check that data monitor displays "On" for approx. 1 second after ignition switch is turned ON, and then changes to "Off".

CAUTION: Never start engine.

Is the inspection result normal?

YES >> GO TO 3.

NO >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-102</u>, "Exploded View".

3.CHECK VDC OFF INDICATOR LAMP SIGNAL (2)

1. Select "ABS", "DATA MONITOR" and "OFF LAMP" according to this order with CONSULT.

2. Check that data monitor displays "On" or "Off" each time when VDC OFF switch is operated.

Is the inspection result normal?

YES >> Check the combination meter. Refer to <u>MWI-21, "CONSULT Function"</u>.

NO >> Check the VDC OFF switch system. Refer to <u>BRC-85, "Diagnosis Procedure"</u>.

INFOID:000000007565823

EXCESSIVE ABS FUNCTION OPERATION FREQUENCY	
< SYMPTOM DIAGNOSIS >	[WITH VDC]
SYMPTOM DIAGNOSIS	
EXCESSIVE ABS FUNCTION OPERATION FREQUENCY	
Description	INFOID:00000000756582
Diagnosis Procedure	INFOID:00000000756582
1.CHECK START	
Check the front and rear brake force distribution using a brake tester. Refer to <u>BR-45, "Gene</u> tions".	<u>eral Specifica</u>
Is the inspection result normal?	
YES >> GO TO 2.	
$2_{\rm CHECK}$ FRONT AND REAR AXLE	
Make sure that there is no excessive play in the front and rear axles	
• Front: Refer to <u>FAX-6, "Inspection"</u> .	
Rear: Refer to <u>RAX-5, "Inspection"</u> .	
Is the inspection result normal?	
NO >> Repair or replace error-detected parts.	
3. CHECK WHEEL SENSOR AND SENSOR ROTOR	
Check the following.	
Wheel sensor installation for damage.	
- Front wheel sensor: Refer to <u>BRC-98</u> , "FRONT WHEEL SENSOR : Exploded View".	
 Rear wheel sensor: Refer to <u>BRC-99, REAR WHEEL SENSOR : Exploded view</u>. Wheel sensor connector connection 	
Wheel sensor harness inspection.	
Sensor rotor installation for damage.	
 Front sensor rotor: Refer to <u>BRC-101, "FRONT SENSOR ROTOR: Exploded View"</u>. Rear sensor rotor: Refer to <u>BRC-101</u>, "REAR SENSOR ROTOR: Exploded View". 	
Is the inspection result normal?	
YES >> GO TO 4.	
NO >> Replace wheel sensor or sensor rotor.	
Front wheel sensor: Refer to <u>BRC-98, "FRONT WHEEL SENSOR : Exploded View</u>	<u>~"</u> .
 Rear wheel sensor: Refer to <u>BRC-99</u>, <u>REAR WHEEL SENSOR</u>: Exploded View Front sensor rotor: Refer to <u>BRC-101</u> "ERONT SENSOR ROTOR : Exploded View 	<u>.</u>
 Rear sensor rotor: Refer to <u>BRC-101, "REAR SENSOR ROTOR : Exploded View</u>" 	<u>.</u>
4. CHECK ABS WARNING LAMP DISPLAY	
Make sure that the ABS warning lamp is turned off after the ignition switch is turned ON or when	n driving.
Is the inspection result normal?	Ŭ
YES >> Normal	
NO >> Perform self-diagnosis for "ABS" with CONSULT.	

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UNEXPECTED PEDAL REACTION

UNEXPECTED PEDAL REACTION

Description

[WITH VDC]

INFOID:000000007565829

Diagnosis Procedure

INFOID:000000007565830

1. CHECK BRAKE PEDAL, BRAKE BOOSTER, BRAKE MASTER CYLINDER

Check the brake pedal, brake booster, brake master cylinder mounting condition.

- Brake pedal: Refer to <u>BR-18. "Exploded View"</u>.
 Brake booster: Refer to <u>BR-28. "Exploded View"</u>.
- Brake master cylinder: Refer to <u>BR-25</u>, "Exploded View".

Is the inspection result normal?

YES >> GO TO 2.

- NO >> Repair or replace error-detected parts.
- 2. CHECK BRAKE PEDAL STROKE

Check the brake pedal stroke. Refer to BR-7, "Inspection and Adjustment".

Is the stroke too large?

- >> Bleed air from brake tube and hose. Refer to <u>BR-11, "Bleeding Brake</u> System". YES
- NO >> GO TO 3.

3.CHECK FUNCTION

Disconnect ABS actuator and electric unit (control unit) harness connector to deactivate ABS. Check if braking force is normal in this condition. Connect connector after inspection.

Is the inspection result normal?

- YES >> Normal
- NO >> Check brake system.

THE BRAKING DISTANCE IS LONG

[WITH VDC] < SYMPTOM DIAGNOSIS > THE BRAKING DISTANCE IS LONG А Description INFOID:000000007565831 **Diagnosis Procedure** В INFOID:000000007565832 **CAUTION:** The stopping distance on slippery road surfaces might be longer with the ABS operating than when С the ABS is not operating. 1.CHECK FUNCTION Turn the ignition switch OFF and disconnect ABS actuator and electric unit (control unit) harness connector to D deactivate ABS. In this condition, check the stopping distance. After inspection, connect connector. Is the inspection result normal? YES >> Normal

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NO

>> Check brake system.

< SYMPTOM DIAGNOSIS >

ABS FUNCTION DOES NOT OPERATE

Description

Diagnosis Procedure

CAUTION:

ABS does not operate when speed is 10 km/h (6 MPH) or lower.

1.CHECK ABS WARNING LAMP DISPLAY

Make sure that the ABS warning lamp turns OFF after ignition switch is turned ON or when driving.

Is the inspection result normal?

YES >> Normal

NO >> Perform self-diagnosis for "ABS" with CONSULT.

INFOID:000000007565833

[WITH VDC]

INFOID:000000007565834

PEDAL VIBRATION OR ABS OPERATION SOUND OCCURS
< SYMPTOM DIAGNOSIS > [WITH VDC]
PEDAL VIBRATION OR ABS OPERATION SOUND OCCURS
Description INFOID:000000007565835
Diagnosis Procedure
CAUTION: Under the following conditions, ABS is activated and vibration is felt when brake pedal is lightly depressed (just place a foot on it).However, this is normal. • When shifting gears • When driving on slippery road • During cornering at high speed • When passing over bumps or grooves [at approximately 50 mm (1.97 in) or more] • When pulling away just after starting engine [at approximately 10 km/h (6 MPH) or higher] 1.SYMPTOM CHECK 1
Check that there are pedal vibrations when the engine is started.
<u>Do vibrations occur?</u> YES >> GO TO 2. NO >> Inspect the brake pedal. Refer to BR-19. "Inspection and Adjustment".
2.SYMPTOM CHECK 2
Check that there are ABS operation noises when the engine is started.
Do the operation noises occur?
NO >> Perform self-diagnosis for "ABS" with CONSULT.
3. SYMPTOM CHECK 3
Check symptoms when electrical component (headlamps, etc.) switches are operated.
<u>Do symptoms occur?</u> YES >> Check if there is a radio, antenna, antenna lead wire, or wiring close to the control unit. If there is, move it farther away.
NO >> Normal

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VEHICLE JERKS DURING VDC/TCS/ABS CONTROL

< SYMPTOM DIAGNOSIS >

VEHICLE JERKS DURING VDC/TCS/ABS CONTROL

Description

INFOID:000000007565837

[WITH VDC]

Diagnosis Procedure

INFOID:000000007565838

1.SYMPTOM CHECK

Check if the vehicle jerks during VDC/TCS/ABS control.

Is the inspection result normal?

YES >> Normal. NO >> GO TO 2.

2.PERFORM SELF-DIAGNOSIS (1)

Perform self-diagnosis for "ABS" with CONSULT.

Are self-diagnosis results indicated?

YES >> Check the corresponding items, make repairs, and perform self-diagnosis for "ABS" with CON-SULT.

NO >> GO TO 3.

3.CHECK CONNECTOR

1. Turn the ignition switch OFF.

- 2. Disconnect ABS actuator and electric unit (control unit) harness connector.
- 3. Check the terminal for deformation, disconnection, looseness, etc.
- 4. Securely connect harness connectors and perform self-diagnosis for "ABS" with CONSULT.

Are self-diagnosis results indicated?

YES >> If poor contact, damage, open or short circuit of connector terminal is found, repair or replace. NO >> GO TO 4.

4.PERFORM SELF-DIAGNOSIS (2)

Perform self-diagnosis for "ENGINE" and "TRANSMISSION" with CONSULT.

Are self-diagnosis results indicated?

- YES >> Check the corresponding items.
- NO >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-102</u>, "Exploded View".

NORMAL OPERATING CONDITION

< SYMPTOM DIAGNOSIS >

NORMAL OPERATING CONDITION

Description

А

INFOID:000000007565839

[WITH VDC]

Symptom	Result	D
Slight vibrations are felt on the brake pedal and the operation noises occur, when VDC, TCS or ABS is activated.		С
Stopping distance is longer than that of vehicles without ABS when the vehicle drives on rough, gravel, or snow-covered (fresh, deep snow) roads.	This is a normal condi- tion due to the VDC, TCS or ABS activation.	
The brake pedal moves and generates noises, when TCS or VDC is activated due to rapid acceleration or sharp turn.		D
The brake pedal vibrates and motor operation noises occur from the engine room, after the engine starts and just after the vehicle starts.	This is a normal, and it is caused by the ABS operation check.	E
Depending on the road conditions, the driver may experience a sluggish feel.	This is normal, because	
TCS may activate momentarily if wheel speed changes when driving over location where friction coefficient varies, when downshifting, or when fully depressing accelerator pedal.	TCS places the highest priority on the optimum traction (stability).	BR
The ABS warning lamp and VDC warning lamp may turn ON when the vehicle is subject to strong shaking or large vibration, such as when the vehicle is rotating on a turntable or located on a ship while the engine is running.	In this case, restart the engine on a normal road. If the normal con- dition is restored, there is no malfunction. At that time, erase the self- diagnosis memory.	G
VDC may not operate normally or the ABS warning lamp and VDC warning lamp may illuminate, when run- ning on a special road that is extremely slanted (e.g. bank in a circuit course).		Н
A malfunction may occur in the yaw rate/side G sensor system, when the vehicle turns sharply, such as dur- ing a spin turn, axle turn, or drift driving, while the VDC function is off (VDC warning lamp illuminated).		
ne vehicle speed will not increase even though the accelerator pedal is depressed, when inspecting the	Normal (Deactivate the VDC/TCS function be- fore performing an in- spection on a chassis dynamometer.)	I
speedometer on a 2-wheel chassis dynamometer.		J
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< REMOVAL AND INSTALLATION >

REMOVAL AND INSTALLATION WHEEL SENSOR FRONT WHEEL SENSOR

FRONT WHEEL SENSOR : Exploded View

INFOID:000000007565840



- 1. Front LH wheel sensor harness con- 2. Front LH wheel sensor nector
- B. Color line (slant line)
- ∠ : Vehicle front

Refer to GI-4, "Components" for symbol in the figure.

NOTE:

The above figure (front side) shows left side. Right side is the mirror image.

FRONT WHEEL SENSOR : Removal and Installation

INFOID:000000007565841

REMOVAL

Be careful with the following when removing sensor.

CAUTION:

- Never twist sensor harness as much as possible, when removing it. Pull sensors out without pulling sensor harness.
- Be careful to avoid damaging sensor edges or rotor teeth. Remove wheel sensor first before removing front or rear wheel hub. This is to avoid damage to sensor wiring and loss of sensor function.
- When you see the harness of the wheel sensor from the front side of the vehicle ensure that the color lines (B) are not twisted.

INSTALLATION

Be careful with the following when installing wheel sensor. Tighten installation bolts to the specified torques.

WHEEL SENSOR

< REMOVAL AND INSTALLATION >

[WITH VDC]

INFOID:000000007565842

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В

- When installing, make sure there is no foreign material such as iron chips on and in the mounting hole of the wheel sensor. Make sure no foreign material has been caught in the sensor rotor. Remove any foreign material and clean the mount.
- When installing wheel sensor, be sure to press rubber grommets in until they lock at locations shown above in the figure. When installed, harness must not be twisted.

REAR WHEEL SENSOR

REAR WHEEL SENSOR : Exploded View



Refer to GI-4, "Components" for symbol in the figure.

REAR WHEEL SENSOR : Removal and Installation

REMOVAL

Be careful with the following when removing sensor.

CAUTION:

- Never twist sensor harness as much as possible, when removing it. Pull sensors out without pulling sensor harness.
- Be careful to avoid damaging sensor edges or rotor teeth. Remove wheel sensor first before removing front or rear wheel hub. This is to avoid damage to sensor wiring and loss of sensor function.

INSTALLATION

Be careful with the following when installing wheel sensor. Tighten installation bolts to the specified torques.

• When installing, make sure there is no foreign material such as iron chips on and in the mounting hole of the wheel sensor. Make sure no foreign material has been caught in the sensor rotor. Remove any foreign material and clean the mount.

BRC-99

INFOID:000000007565843

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< REMOVAL AND INSTALLATION >

• When installing wheel sensor, be sure to press rubber grommets in until they lock at locations shown above in the figure. When installed, harness must not be twisted.

SENSOR ROTOR

< REMOVAL AND INSTALLATION > [WITH VDC]
SENSOR ROTOR
FRONT SENSOR ROTOR
FRONT SENSOR ROTOR : Exploded View
Refer to FAX-8, "Exploded View".
FRONT SENSOR ROTOR : Removal and Installation
REMOVAL
Sensor rotor cannot be disassembled. Remove the sensor rotor together with hub bearing assembly. Refer to FAX-8, "Removal and Installation".
FAX-8. "Removal and Installation". REAR SENSOR ROTOR
REAR SENSOR ROTOR : Exploded View
Refer to <u>RAX-7, "Exploded View"</u> .
REAR SENSOR ROTOR : Removal and Installation
REMOVAL
Sensor rotor cannot be disassembled. Remove the sensor rotor together with hub bearing assembly. Refer to RAX-7, "Removal and Installation".
INSTALLATION Sensor rotor cannot be disassembled. Install the sensor rotor together with hub bearing assembly. Refer to
RAX-7, "Removal and Installation".

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ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< REMOVAL AND INSTALLATION >

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

Exploded View

INFOID:000000007565848

[WITH VDC]



- 1. ABS actuator and electric unit (control 2. Bracket unit)
- A. To rear RH brake caliper
- D. To front RH brake caliper
- B. To rear LH brake caliper
- E. To front LH brake caliper
- C. From master cylinder primary side
- F. From master cylinder secondary side

: Vehicle front

Refer to <u>GI-4, "Components"</u> for symbol in the figure.

Removal and Installation

INFOID:000000007565849

REMOVAL

CAUTION:

- Never spill or splash brake fluid on painted surfaces. Brake fluid may seriously damage paint. Wipe it off immediately and wash with water if it gets on a painted surface.
- Before servicing, disconnect the battery cable from negative terminal.
- To remove brake tube, use a flare nut wrench to prevent flare nuts and brake tube from being damaged. To install, use flare nut crowfoot and torque wrench.
- Never apply excessive impact to ABS actuator and electric unit (control unit), such as dropping it.
- Never remove and install actuator by holding harness.
- 1. Remove cowl top. Refer to <u>EXT-20, "Exploded View"</u>.
- 2. Disconnect ABS actuator and electric unit (control unit) harness connector.
- 3. Loosen brake tube flare nuts, then remove brake tubes from ABS actuator and electric unit (control unit).
- 4. Remove ABS actuator and electric unit (control unit) bracket mounting bolts.
- 5. Remove ABS actuator and electric unit (control unit) from vehicle.

INSTALLATION

Note the following, and install in the reverse order of removal.

• Before servicing, disconnect the battery cable from negative terminal.

Revision: 2013 February

BRC-102

2012 Murano CrossCabriolet

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< REMOVAL AND INSTALLATION >

- To remove brake tube, use a flare nut wrench to prevent flare nuts and brake tube from being damaged. To install, use flare nut crowfoot and torque wrench.
- Never apply excessive impact to ABS actuator and electric unit (control unit), such as dropping it.
- Never remove and install actuator by holding harness.
- After work is completed, bleed air from brake tube. Refer to <u>BR-11, "Bleeding Brake System"</u>.
- After installing harness connector in the ABS actuator and electric unit (control unit), make sure harness connector is securely locked.
- After removing an ABS actuator and electric unit (control unit), be sure to perform the following procedure.
- Calibration of decel G sensor: Refer to <u>BRC-33, "Description"</u>.
- After replacing an ABS actuator and electric unit (control unit), be sure to perform the following procedure.
- Adjustment of steering angle sensor neutral position: Refer to BRC-31, "Description".
- Calibration of decel G sensor: Refer to <u>BRC-33</u>, "Description".

Install ABS actuator and electric unit (control unit) as per the following steps.

- 1. Temporarily tighten mounting bolt (1) because the bracket (2) is temporarily being hold.
- 2. Tighten mounting bolt (3) while holding the bracket.
- 3. Tighten mounting bolts to the specified torque in the order of (4), (1).



[WITH VDC]

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< REMOVAL AND INSTALLATION >

YAW RATE/SIDE/DECEL G SENSOR

Exploded View

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[WITH VDC]



1. Yaw rate/side/decel G sensor 2. Connector

C: Vehicle front

Refer to GI-4, "Components" for symbol in the figure.

Removal and Installation

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REMOVAL

CAUTION:

Never drop or strike yaw rate/side/decel G sensor, or never use power tool etc., because yaw rate/side/ decel G sensor is sensitive to the impact.

- 1. Remove center console assembly. Refer to IP-20, "Exploded View".
- 2. Remove rear ventilator duct. Refer to VTL-14, "REAR FOOT DUCT 2 : Removal and Installation".
- 3. Disconnect yaw rate/side/decel G sensor harness connector.
- 4. Remove mounting nuts.
- 5. Remove yaw rate/side/decel G sensor.

INSTALLATION

Note the following, and install in the reverse order of removal.

- Never drop or strike yaw rate/side/decel G sensor, or never use power tool etc., because yaw rate/side/decel G sensor is sensitive to the impact.
- After removing/replacing a yaw rate/side/decel G sensor, be sure to perform the calibration of decel G sensor. Refer to <u>BRC-33</u>, "<u>Description</u>".

STEERING ANGLE SENSOR

< REMOVAL AND INSTALLATION >

STEERING ANGLE SENSOR

Exploded View

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1. Steering angle sensor

C: Vehicle front

Removal and Installation

REMOVAL

- 1. Remove spiral cable assembly. Refer to <u>SR-14, "Exploded View"</u>.
- 2. Remove steering angle sensor from spiral cable assembly.

INSTALLATION

Note the following, and install in the reverse order of removal.

- Never reuse steering angle sensor.
- After removing/replacing a steering angle sensor, be sure to perform the adjustment of steering angle sensor neutral position. Refer to <u>BRC-31</u>, "<u>Description</u>".

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< REMOVAL AND INSTALLATION >

VDC OFF SWITCH

[WITH VDC]

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Removal and Installation

REMOVAL

- 1. Remove lower instrument panel LH. Refer to IP-13, "Removal and Installation".
- 2. Remove VDC OFF switch.

INSTALLATION

Installation is the reverse order of removal.